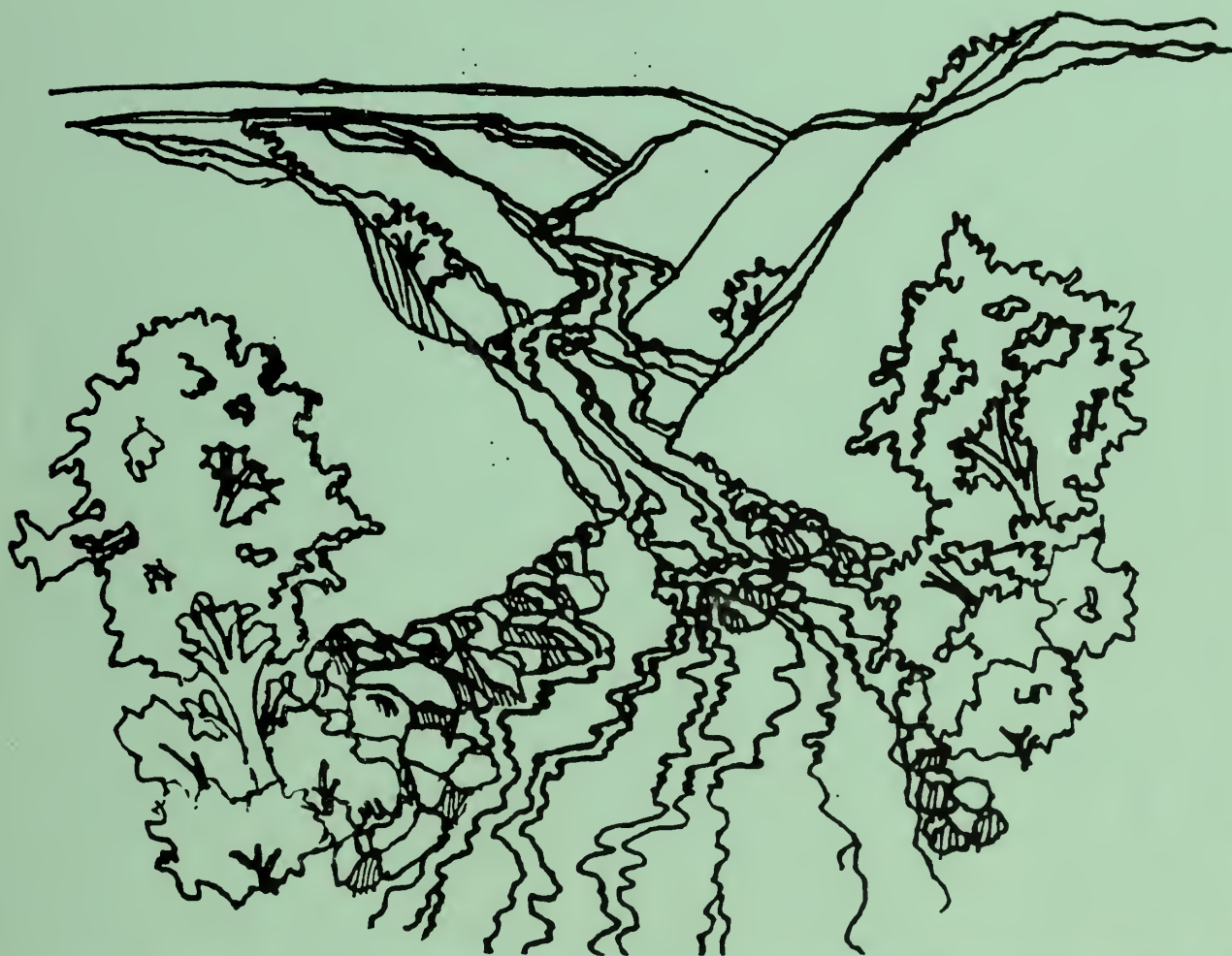


JOHN'S

NEW RIVER GORGE National River


Fecal Coliform Study

April-September
1990



National Park Service
New River Gorge National River
Division of Resource Management
and Visitor Protection
Resource Management Section





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NEW RIVER GORGE NATIONAL RIVER
FECAL COLIFORM STUDY
APRIL-SEPTEMBER
1990

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For New River Gorge National River
Resource Management and Visitor Protection
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INTRODUCTION

This report represents the findings of the 1990 Water Quality Monitoring Program and is a continuation of the water quality studies conducted at the New River Gorge National River (NERI) since 1980. Any trends between fecal coliform bacteria counts, stage level and 48 hour precipitation (48prcp.) will be discussed.

NERI is on a stretch of the New River flowing north from below the Bluestone Dam, near Hinton, West Virginia, to just north of the U.S. Highway 19 bridge near Fayetteville, West Virginia. The headwaters of the New River are located high in the Southern Appalachian Mountains in northwestern North Carolina. From Blowing Rock, North Carolina, the New River flows generally in a northward direction across southwestern Virginia and enters West Virginia 163 miles from its source. The river continues flowing northward for 87 miles to Gauley Bridge where it joins the Gauley River and forms the Kanawha River. The Kanawha River flows northwest to Point Pleasant, West Virginia and joins the Ohio River, which is part of the Mississippi watershed. From the New River's headwaters in Blowing Rock, to Nitro, West Virginia the New/Kanawha River's course follows that of the ancient Teays River, which began forming as the southern Appalachians rose out of an ancient ocean. Mountain uplift and subsequent erosion have exposed many types of rock in the basin, most typical are shales, sandstones and limestones. On its journey to the Gorge, the New River passes through extensive karst (an area of limestone formations) areas and gathers water from other streams that drain these calcareous lands. Consequently, the New River is a well buffered, biologically productive stream (WVDNR 1987-88, p.9).

NERI was established by the United States Congress in 1978 and placed under management of the National Park Service (NPS), an agency of the United States Department of the Interior. Title XI of the National Parks and Recreation Act of 1978 (Public Law 95-625) set aside a 62,000 acre corridor along 52 miles of New River "... to conserve and interpret the outstanding natural, scenic, and historic values and objects in and around the New River Gorge and preserve as a free flowing stream an important segment of the New River in West Virginia for the benefit and enjoyment of future generations. . ." (WVDNR 1987-88, p.1).

In considering the mandate of the NPS and NERI, the park became interested in the quality of the water resources found within the park boundary (park watershed). In 1980 NERI began a water quality program to build baseline data upon which future monitoring and management activities could be built. Since the West Virginia Division of Natural Resources (WVDNR) was

interested in establishing baseline water quality data for some tributaries of the New River, and NERI, in its fledgling stages, lacked proper laboratory facilities, the two joined in a cooperative agreement. From 1980 to 1984 the WVDNR did water quality studies for NERI. These studies looked at several parameters commonly related with commercial and domestic pollution (ie total aluminum, total cyanide, total iron, fecal coliform etc.). After examining the data from 1980 to 1984 NERI determined that sewage and/or animal wastes were a major cause for concern because of the large amount of body contact associated with recreational activities on the New River. In 1985 NERI attempted to begin monitoring for fecal coliform bacteria, the accepted indicator for sewage and animal waste contamination (SM 901A.), with Colicount samplers (from Millipore Corporation). This method is quick and inexpensive but it is not an EPA approved method. An unpublished report by NERI on the 1985 sampling effort recommended the use of an approved standard method and an approved laboratory for future bacteria monitoring efforts.

In 1986, based on the above recommendations, NERI coordinated with the USDA Appalachian Soil and Water Research Lab Facilities to use their lab to analyze fecal coliform bacteria samples. The Membrane Filter Technique (SM 090C), an EPA approved analytical method, was used with satisfactory results. In 1987, because of staff changes at NERI and inconsistencies in the 1986 data, it was decided again to contract with the WVDNR to do fecal coliform bacteria studies on the New River and selected tributaries. The result of this agreement was the "New River Gorge National River Fecal Coliform Study, April-September, 1987-1988" done by WVDNR. In 1990, in an effort to train the NERI staff and begin the establishment of an approved water quality lab, NERI staff took over the fecal coliform studies from WVDNR and again conducted the studies with assistance of the USDA lab in Beckley.

MONITORING AREA

The sample sites for the 1990 fecal coliform study included mainstem and tributary locations from Hinton in the south to Fayetteville in the north. All but three of the nineteen stations were located within the boundaries of the NERI. The three outside the boundary were New River at Hinton Visitor Center (1M), Madam's Creek in Hinton (2M) and Keeney's Creek in Winona (16T).

As previously mentioned, the NERI study differed in scope from previous WVDNR efforts. The NERI study included several tributaries not tested for fecal coliform bacteria under the 1989 WVDNR sampling strategy. These stations were Lick Creek (5T), Laurel Creek (7T) and Mann's Creek (14T). The WVDNR program sampled for other parameters at these sites.

Additionally, the NPS study excluded four of the sites tested by the WVDNR for parameters other than fecal coliform bacteria concentrations. Research had borne out the fairly high water quality of these tributaries. The four stations were the mouths of Farley's, Mill, Dowdy and Buffalo Creeks (Wood, 1990).

Table 1 shows the mainstem (M) and tributary (T) sites, beginning with the station furthest downstream and proceeding upstream. The map codes correspond to the site locations shown in Figure 1.

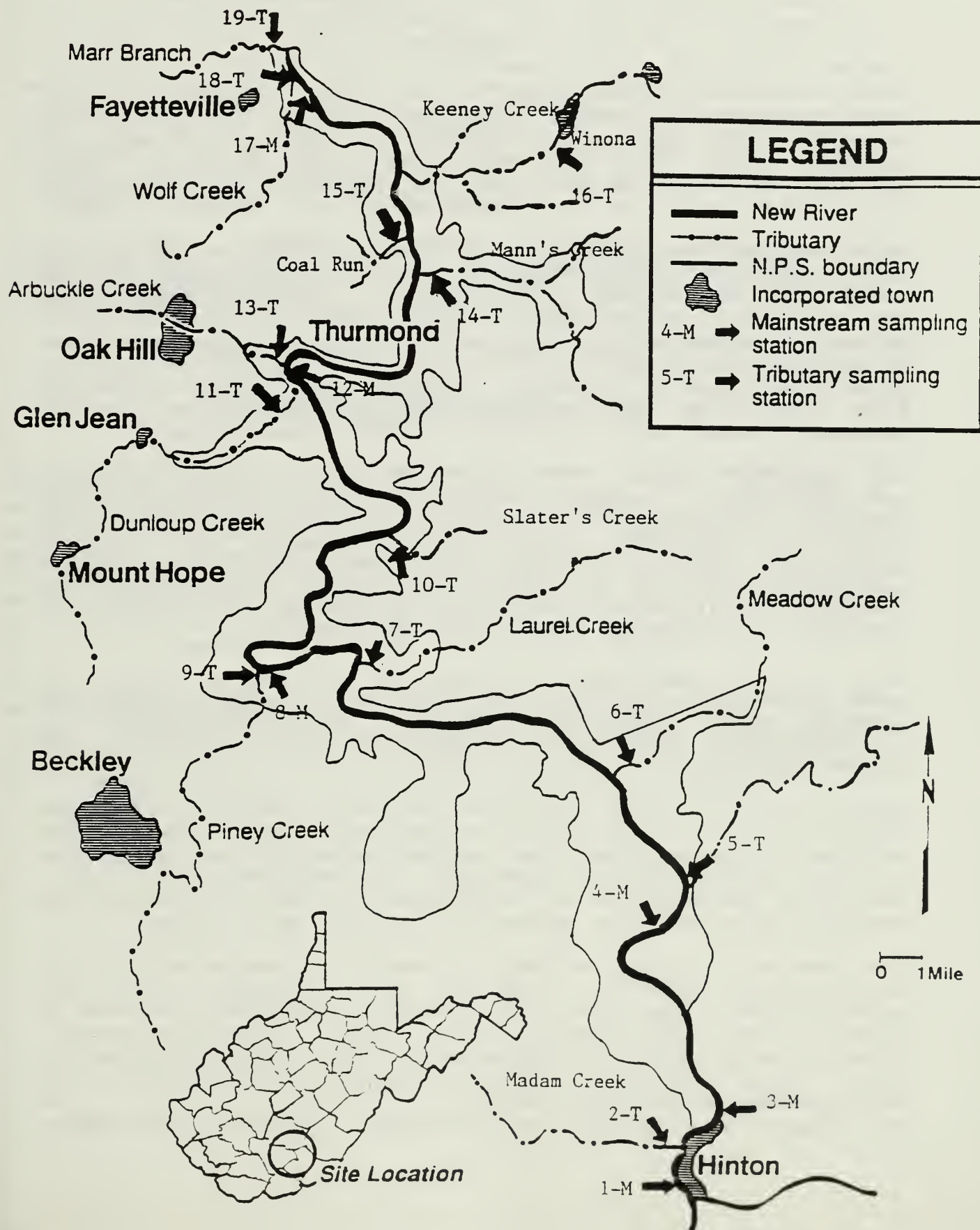
TABLE 1. MAINSTEM AND TRIBUTARY SAMPLING SITES, NEW RIVER GORGE NATIONAL RIVER. FECAL COLIFORM STUDY, 1990.

MAP CODE	STATION LOCATION
1M	New River at Hinton NPS visitor center
2T	Madam Creek near mouth
3M	New River below Hinton sewage treatment plant
4M	New River above Sandstone Falls
5T	Lick Creek at stream gage site
6T	Meadow Creek at stream gage site
7T	Laurel Creek at Quinnimont (at stream gage site)
8M	New River at Prince (midpoint on bridge)
9T	Piney Creek at McCreery (stream gage site)
10T	Slater's Creek at Thayer (near mouth)
11T	Dunloup Creek at stream gage site
12M	New River at Thurmond (below Dunloup Creek, river right)
13T	Arbuckle Creek at stream gage site
14T	Mann's Creek near mouth
15T	Coal Run near mouth
16T	Keeney Creek at Winona
17M	New River at Favette Station (swimming area)
18T	Wolf Creek at mouth
19T	Marr Branch below Rivers, Inc. campground

Figure 1: A map of the sampling area for the 1990 fecal coliform study at NERI.

Map of New River Gorge Fecal Coliform Study Area

April - September, 1990.



METHODS

Fecal coliform bacteria, found in the digestive tracts of warm-blooded animals, are useful indicators of water pollution. These organisms, while not harmful themselves, signal the presence of pathogens that are discharged with fecal wastes. Easily isolated, they were selected as the parameter for determining fecal contamination in the streams under study (WVDNR, 1987-88).

Water samples were collected approximately twice per month, from May to September. This period corresponds with the recreational season that centers on the New River. Tributary sampling was done most often at the stream mouth in order to account for all potential sources of pollution and to give an adequate assessment of pollutants entering the National River. Samples at mainstem sites were taken as close as possible from the actual current flow. Collection from the New River at Prince, 8M, involved lowering a bucket into the river from the Prince bridge.

Two sampling routes were divided between two Resource Rangers and consisted of separate North and South District stations (Table 1: South District = 1M thru 9T; North District = 10T thru 19T). Initially, all North District samples were collected during the same run. It was found, however, that collection and processing could not be accomplished within the allowable time limits. Division of the route on June 12 provided for more reliable processing and interpretation of samples.

The collection, handling, processing and analysis of samples was based on EPA-approved procedures detailed in Standard Methods for the Examination of Water and Wastewater, 16th edition (1985). As a young program, improvements in all these areas were made as the season progressed.

Samples were collected in plastic, Nalgene, screw-cap bottles and preserved during transit to the laboratory in ice chests. The maximum six-hour holding time between collection and processing of the bacteriological samples was observed (EPA, p.30). Processing and analysis was performed at the USDA Appalachian Soil and Water Research Laboratory, Beckley, West Virginia.

The membrane filter method was used to determine densities of fecal coliform bacteria. Use of this procedure offers such advantages as speed, ease of processing, and direct counting of colony growth following a 22-24 hour incubation period. Disadvantages result from impedance of fecal growth by sediment from turbid waters, other bacterial populations, and environmental stress (EPA, p.71).

Two volumes were filtered for each sample. Dilutions were chosen

so as to produce between 20-60 colonies, the acceptable range to facilitate fecal coliform bacteria. Two different volumes were often used. These ranged from .25 mL to 100 mL. Consideration was given to such factors as stream level, turbidity, water temperature and prior results in determining the amounts. When volumes were 20 mL or less, ten mL of buffered dilution water was added to the funnel. Commercially prepared M-FC media, contained in 2.1 mL ampoules, was used to grow the fecal coliform colonies. The cultures were incubated in a water bath for 24 +/- 2 hours at 44.5 +/- .2 degrees Celsius.

Colonies were counted directly following incubation and densities were calculated and reported as fecal coliforms per 100 mL (Standard Methods, Section 909C, 909A.6). Computations were made according to the general formula:

Fecal coliform colonies per 100 mL =

$$\frac{\text{Coliform colonies counted} \times 100}{\text{mL sample filtered}}$$

The West Virginia Water Resources Board, for protection of recreational use and public water supply, has set a standard of no more than 200 counts per 100 mL for fecal coliform bacteria expressed as a geometric mean, based on no less than 5 samples per month. Since NERI only sampled two times a month, per site, the results must be looked at as an indicator of streams that may have exceeded the above standard. Interpretation of the results of the 1990 New River study has been based primarily on whether or not a stream met, or failed to meet, this criterion.

Water quality data was collected for additional parameters and was used in the evaluation of the fecal coliform results. These items included: weather conditions, stream level, water temperature and pH. All information was recorded on data sheets and entered into a water quality data base file (Appendix 1).

RESULTS AND DISCUSSION

This section contains an analysis of the data generated during the 1990 monitoring season. The discussion will focus on the bacteria counts exceeding the acceptable limit of 200 FC per 100 mL. Recall that the WVWRB requires that five samples be tested from each site every month in order for the standard to be applied legally. NERI only sampled 2 times a month, so the results of this study must be looked at as being an indicator of streams that may be in violation. The counts for the sample sites are found in Appendix 4. Appropriate correlations will be made between bacterial numbers and data gathered for such factors as 48-hour precipitation, and stream level. Figures 2-20 show the relationship of these three parameters. Each site has a corresponding figure. Frequent references will be made to monitoring results described in two studies published by the WVDNR in 1989 and 1990, respectively: New River Gorge National River Fecal Coliform Study, April-September 1987-1988; and New River Gorge National River Water Quality Study, 1990 (the latter contains 1989 data).

1M, New River at Hinton NPS Visitor Center (see Figure 2)

No violations of the standard were recorded at this station and bacteria counts were relatively low. With the exception of several violations in 1987 and 1989, the 1990 results show a continuing trend of fairly good water quality at this site.

2T, Madam Creek near mouth (see Figure 3)

The high fecal bacteria levels recorded at this site in 1989 and 1990 indicate the serious impact of waste loads upon Madam Creek. All 1990 counts were well in excess of the standard; the highest level was 5400 Fecal Coliform Colonies (FC) per 100ml. A likely cause of these violations is the discharge of sewage from houses along the stream. This direct impact was witnessed by a Resource ranger dispatched to investigate a sudden decline of crayfish in the stream. Another possible contributor might be the presence of livestock at the headwater drainage of Madam Creek (WVDNR 1990, p.8).

3M, New River below Hinton sewage treatment plant (see Figure 4)

Statistics from 1987-1990 reveal that bacteria concentrations at this station were the highest for any mainstem site. In fact, the largest count yielded by any sample during the 1990 season, 16,400 FC/100 mL, occurred here in August. The greatest numbers recorded by WVDNR efforts were also obtained in that month. Many 1990 samples contained bacteria that were TNTC (too numerous to

count). Park Service and WVDNR samplers have attested to the repulsive odors and visual degradations at this site.

Effluent from the Hinton sewage treatment plant (STP) enters the New River just thirty yards above the sampling point. This outdated plant's capacity to treat its sewage loads is inadequate. However, differences in river flow, overflow from the STP and degree of treatment cause variations in FC counts (WVDNR 1987-88, p. 27). For example, the concentration on July 5, 1990 was 50 FC/100 mL. The July 16 count of 933 coincided with a period of higher river levels and increased precipitation. Statistics from 1987-1989 dramatically illustrate these fluctuations.

4M, New River above Sandstone Falls (see Figure 5)

No violations occurred here during 1990 sampling. The highest count, 134 FC/100mL occurred on May 22 and may have resulted from increases in both precipitation and flows from Bluestone dam. It appears that this site is not impacted by the Hinton STP.

5T, Lick Creek at stream gage site (see Figure 6)

Two counts above the standard were recorded at this station. Higher precipitation and river flows were responsible for these numbers. Although low FC concentrations were recorded here during dry periods and low Bluestone gage readings, a number of counts were either close to, or above, 100 FC/100 mL.

6T, Meadow Creek at stream gage site (see Figure 7)

A pattern of higher FC readings based on greater stream flow and turbid conditions was evident at this site. According to the 1987-88 WVDNR report, Meadow Creek is occasionally affected by wastewater from the STP at Meadow Bridge. It mentions further that, as a result of the "flushing effects of runoff," FC concentrations in streams impacted by non-point pollutants are higher in the spring than during the summer months (p.30). 1990 statistics at this site reveal this pattern to an extent, particularly in May and September. Several counts, such as the 613 FC/100 mL reading on July 16, deviated from this trend. An associated pattern of higher FC readings based on greater stream flow and turbid conditions did exist.

7T, Laurel Creek at Quinnimont (at stream gage site) (see Figure 8)

A single violation on July 16 of 293 FC/100mL was detected at Laurel Creek during the testing period. Rainfall and the resulting heavier stream flow caused one other substantial count on May 22 of 97 FC/100mL. Otherwise, the good water quality findings in 1990 confirm those obtained by the WVDNR in 1987.

8M, New River at Prince (midpoint on bridge) (see Figure 9)

This site was not once in violation of the standard. Helping this site is the relative cleanliness of Laurel Creek (7T). It is noteworthy that the effects of rainfall and significant stream flow upon FC counts were seen at this site on two dates (May 22, 86 FC/100mL; July 16, 147 FC/100mL).

T9, Piney Creek at McCreery (stream gage site) (see Figure 10)

According to the 1987-88 DNR study, inadequate facilities at the Beckley and North Beckley STPs have caused a severe waste load problem in Piney Creek. Specifically, overloading and overflowing have resulted in many violations (p.31). All WVDNR samples in 1989 were well above the limit. Last year's numbers were not nearly as great as those from the three previous years. Nonetheless, the three violations and five counts above 100 FC/100ml indicate a continuing problem with the stream.

10T, Slater's Creek at Thayer (near mouth) (see Figure 10)

With the exception of one violation and one count raised by precipitation, bacteria concentrations at Slater's Creek were low. 1989 statistics also revealed a single count above the standard. The cause of the 1990 violation, which occurred on July 12 after a dry 48-hour period, is unclear. The reading of 294 FC/100mL may have been distorted because the coliform growth on the test plate was somewhat indistinct (FC on the other plate were blurred and invalid). The count of 152 FC/100mL on August 20 may have resulted from the "flushing effect of rainfall" (WVDNR, 1987-88, p. 31).

11T, Dunloup Creek at stream gage site (below White Oak STP) (see Figure 11)

DNR reports from 1987-89 indicate that a serious waste load problem has existed in Dunloup Creek. The main contributors have been the Mt. Hope STP and direct discharge from residences in the town of Kilsyth. (Several miles downstream of these locations, the creek exudes an obvious sewage odor). Although the White Oak STP was given a good rating during periods of normal flow, stormwater inflow still affected the stream below the facility (WVDNR, p. 38). Corrective measures were undertaken, but frequent 1989 violations evinced continuing sewage problems. However, a single violation of 1740 FC/100mL was associated with this tributary in 1990 (Because of the small and watery nature of the FC on this test plate, the 1740 figure must be considered a rough estimate). Four other concentrations, however, were above 100 FC/100mL.

Nonetheless, comparison of 1987-89 and 1990 levels shows a dramatic decrease in bacteria concentrations. It should be noted

that the initial sampling procedures in the North District (Methods section) caused a greater than allowable lapse between collection and incubation. This factor might partly explain the abnormally low reading of 52 FC/100mL for May 31, a date on which stream levels were high following significant precipitation.

The June 14 run, that followed the division of the North District route, resulted in a more appropriate count of 152 FC/100mL. This occurred even though the stream level had decreased since May 31 and no precipitation had fallen during the previous 48 hours.

Monitoring and investigation in 1991 will render additional information about the health of Dunloup Creek. As a stream that passes through several communities, is fished heavily when stocked with trout below the White Oak STP, and serves boaters as an access to the New River, Dunloup warrants serious attention.

12M, New River at Thurmond (see Figure 13)

The New River at this site may be susceptible to sewage loads from both Dunloup Creek and even Piney Creek further upstream (WVDNR, 1990, p.6). However, it produced only one violation of 357 FC/100mL on May 31. On this date, the river was extremely turbid and registered 13.28' at the Thurmond gage. Dilution by the river of upstream effluent and warmth of the sluggish waters at the sample site reduce the survivability of fecal coliform here. (WVDNR, 1987-88). Water temperatures reached 26.5 degrees Celsius at this station. On the whole, bacteria levels were quite low.

13T, Arbuckle Creek at stream gage site (see Figure 14)

FC concentrations in Arbuckle Creek were found to be much higher in 1988-89 than during the 1990 season. Many violations occurred during the former period and during previous sampling studies, supporting the DNR statement that this stream is seriously polluted (WVDNR 1990, p. 8). Chief causes of the sewage problem have been the STPs of Oak Hill and the Arbuckle Public Service District (PSD) in Minden (WVDNR 1987-88, p. 32).

It appears, therefore, that results during the 1990 study are inconclusive. The stream was in violation of the standard on August 20 (TNTC) but produced just two other counts greater than 100 FC/100ml. Four other counts were at or near 100 FC/100mL. However, notation of poor stream conditions by the NPS sampler fully support the DNR findings. As in the case of Dunloup Creek, further sampling should produce more definitive results.

14T, Mann's Creek near mouth (see Figure 15)

Analysis of 1990 samples disclosed relatively low bacteria densities for this stream. The 112 FC/100mL reading on August 22 was more than double the next highest reading. Water clarity at this site was often superior to most other North District stations. The DNR did not sample Mann's Creek during the 1987-89 period.

15T, Coal Run near mouth (see Figure 16)

NPS and DNR results for this stream generally show coliform counts below 100 FC/100 mL. The samples giving the largest numbers last season, 135 FC/100mL and 128 FC/100mL, were collected during turbid stream conditions.

16T, Keeney's Creek at Winona (see Figure 17)

DNR and NERI monitoring efforts in 1989 and 1990, respectively, attest to the significant concentrations of bacteria in this stream. In both years, all but one of the samples exceeded the standard. Although the DNR samples produced larger numbers, 1990 densities easily surpassed 1000 FC/100mL four times. The highest reading was 3997 FC/100mL, a count that may well be conservative.

Although the water of Keeney's Creek usually appeared clear, this clarity only helped identify the numerous pieces of trash in the stream. It is likely, since the community of Winona is located along the creek, that the high bacteria counts also stem from human sources. Incredulous though it may seem, stocked trout have been swimming these waters (WVDNR 1990, p. 8).

17M, New River at Fayette Station (swimming area) (see Figure 18)

The only violation occurred on May 31, a date on which the river level reached 13' at Fayette Station. All other counts were low, particularly those from July to September. These figures corresponded with mostly negative river levels. For example, on July 10 the river ran at -.73 and the count of 3 FC/100mL was the lowest found at this site. On this date, furthermore, the water temperature was a warm 27 degrees Celsius and no precipitation had fallen in 48 hours. This pattern of low flows, high water temperatures, slight or no precipitation and few bacteria occurred several times from July through September.

Fecal coliform bacteria may not survive well under these conditions in a large volume stream. The water temperature, furthermore, would tend to increase faster in a deep eddy such as the Fayette Station site.

An interesting, but nearly opposite trend occurred in the cases of two streams sampled on the same days as 17M. Keeney's Creek

and Marr Branch produced consistently high FC counts during the July to September stretch. These tributaries are extremely impacted by sewage and do not have the volumes to dilute the effluent.

NPS bacteria counts at 17M were vastly lower than 1989 levels and less than, but much closer to, 1988 figures. In 1989, the DNR changed its sampling site at Fayette Station from the pool above the mouth of Wolf Creek to a point below it. Both sites were on the west side of the river, river left. This was probably done to account for effluent entering the New from Wolf Creek (WVDNR 1990, p. 6). FC counts rose from 1988 to 1989, indicating the impact of Wolf Creek upon the mainstem.

18T, Wolf Creek near mouth (see Figure 19)

Sampling of Wolf Creek was done mostly during dry periods, causing low flows and yielding fairly low FC concentrations. All readable counts were below 100 FC/100mL. Samples from two dates that were preceded by significant precipitation either produced lower than expected or invalid results. Rainfall for the May 31 run was .42" and the gage level was relatively high at 1.90'; the count was just 88 FC/100mL. Poor development of colonies and possible fungal growth rendered the test plates for June 12 invalid. Precipitation was 0.51" for the previous 48 hours and the level was 1.92'. The sampler indicated that the count on one of the plates was possibly TNTC.

A violation of the standard under the described conditions would show that FC concentrations in this stream rise with significant rainfall and water levels. According to the DNR, Wolf Creek would be impacted more strongly under these circumstances because raw effluent overflows the lift station on House Branch of Wolf Creek (WVDNR, p. 33).

It is important to note that the 1990 fecal coliform values for the creek differ greatly from 1989 but are somewhat similar to those obtained in 1988. In 1989, Wolf Creek was in violation four of six sampling events. Drought conditions throughout the summer of 1988 caused low flows and were not conducive to the survival of FC.

19T, Marr Branch below Rivers, Inc., campground (see Figure 20)

"Big Nasty" rapid on the New River below the mouth of Marr Branch is appropriately named. Figures from 1988 through 1990 manifest the negative impact upon this stream of Fayetteville's overloaded STP (WVDNR 1987-88, pp. 33-34). Six counts in 1990 easily exceeded the standard.

Values obtained in 1988 and, to some extent, in 1990, reveal an interesting relationship between stream flow and fecal coliform concentrations in Marr Branch. When the stream ran at lower

levels, the bacteria became more concentrated. When the flow was greater, such as during the spring runoff, counts were less. This pattern is opposite the usual trend.

The explanation lies with the condition of the STP. As of 1988, the facility was so overloaded that stormwater diluted the influent. The effluent contained much less bacteria than during regular or low flows, at which times it was practically raw sewage. During the spring of 1988, nine of fourteen FC values were under 1000 FC/100ml. During July and August, six of ten readings were 100,000 FC/100ml or greater. During the spring of 1990, Marr Branch was not in violation of the standard (The reading on June 12 was invalid; the stream level on this date was high and .51" of precipitation had fallen.). From July through September, a period of low flows, all counts were in violation. The highest value of 6800 FC/100mL occurred on September 4, the date on which the stream level reached its lowest point of the season.

CONCLUSION

The data for 1990 reveals a slight improvement in fecal coliform bacteria levels over the last two years. Percentage wise all the sites on the New River had a decrease in fecal coliform bacteria levels except New River, below the Hinton Sewage Treatment Plant, 3M. This site had 8 samples out of ten exceeding the 200 fecal coliform bacteria per 100ml. New River at Thurmond, 12M, and New River at Fayette Station, 17M, had only one sample that was above the standard.

On the tributaries sampled, three had no counts above the standard. These were Mann's Creek, 14T, Coal Run, 15T, and Wolf Creek, 18T. Three other creeks exhibited significant decreases from 1987-89 in fecal coliform bacteria concentrations, these were Piney Creek, 9T, Dunloup Creek, 11T, and Arbuckle Creek, 13T.

The creeks that still maintained high readings were Madam's Creek, 2T, Keeney's Creek, 16T, and Marr Branch, 19T. All of the samples taken on Madam's Creek exceeded the standard and all but one sample on Keeney's Creek exceeded the standard. Marr Branch had six samples out of 10 that surpassed the standard. Of these three creeks, Marr Branch poses the greatest public risk to the public because it flows through the Rivers Inc. rafting company campground. Also it had been reported that visitors use the falls downstream, within the NERI boundary, as a place to wash up while camping.

Since this report was published after the completion of the 1991 report, recommendations will not be made for 1991. For recommendations on future sample site choices and future action at problem areas, please see the NERI Fecal Coliform Study, April through September, 1991.

FIGURES EXPLANATION

The following figures represent the fecal coliform data for the 1990 NERI fecal coliform study. It should be noted that each chart should be looked at separately. The vertical "y" axis changes from chart to chart, so the figures cannot be compared directly. Also note that the stream level unit is in tenths of feet. The rainfall is the amount of precipitation that fell within a 48 hour period before the date listed.

Figure 2. Fecal Coliform Data for New River at Hinton Visitor Center

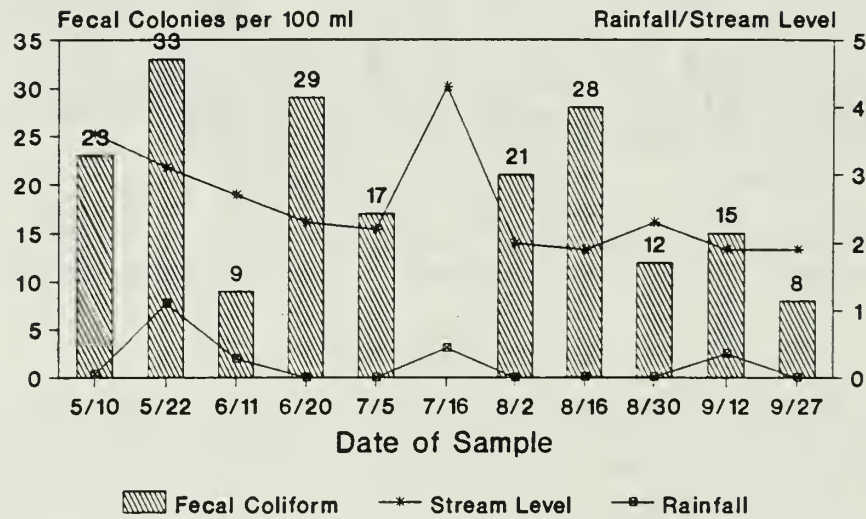


Figure 3. Fecal Coliform Data for Madam Creek

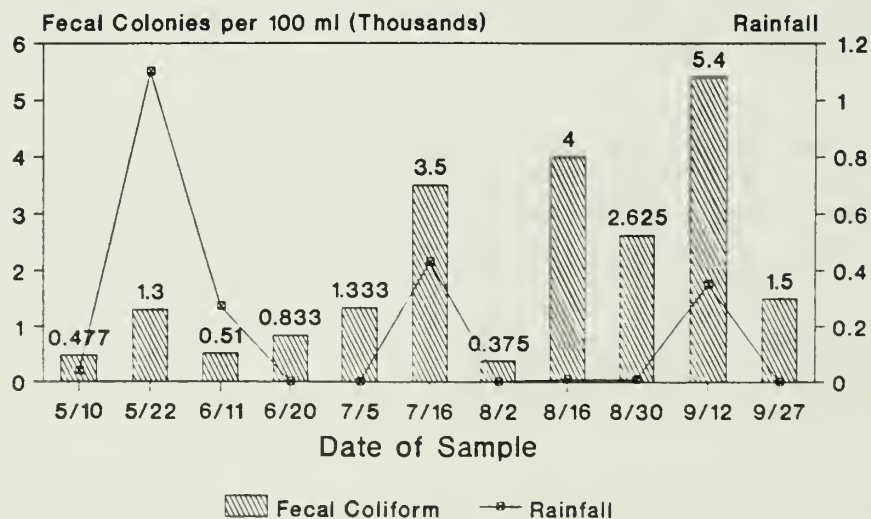
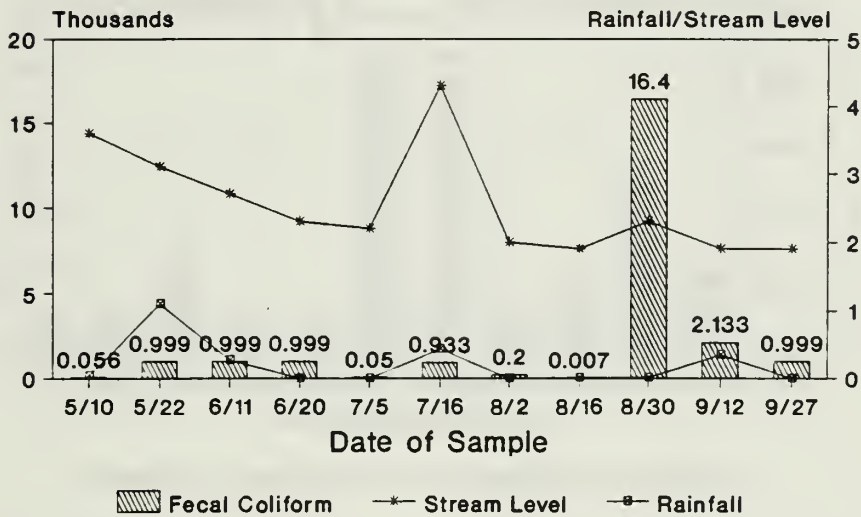


Figure 4. Fecal Coliform Data for New River at Hinton STP



The 999 readings represent TNTC counts

Figure 5. Fecal Coliform Data for New River at Sandstone Falls

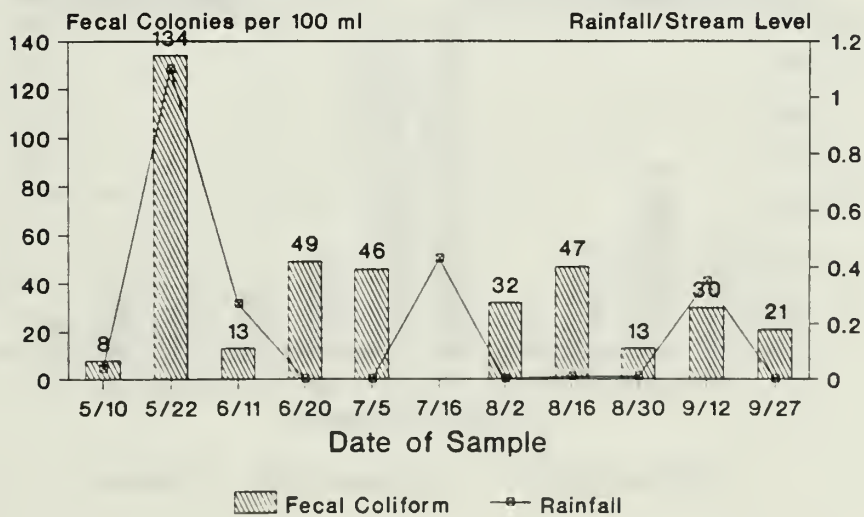


Figure 6. Fecal Coliform Data for Lick Creek

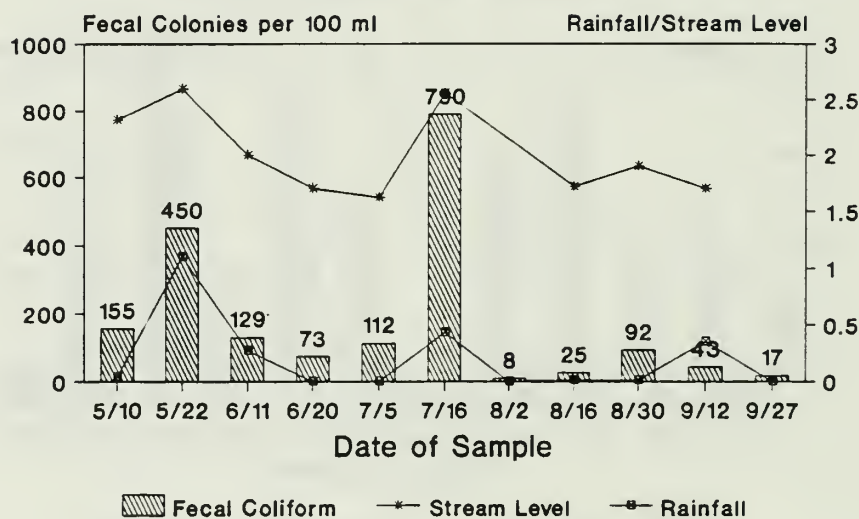


Figure 7. Fecal Coliform Data for Meadow Creek

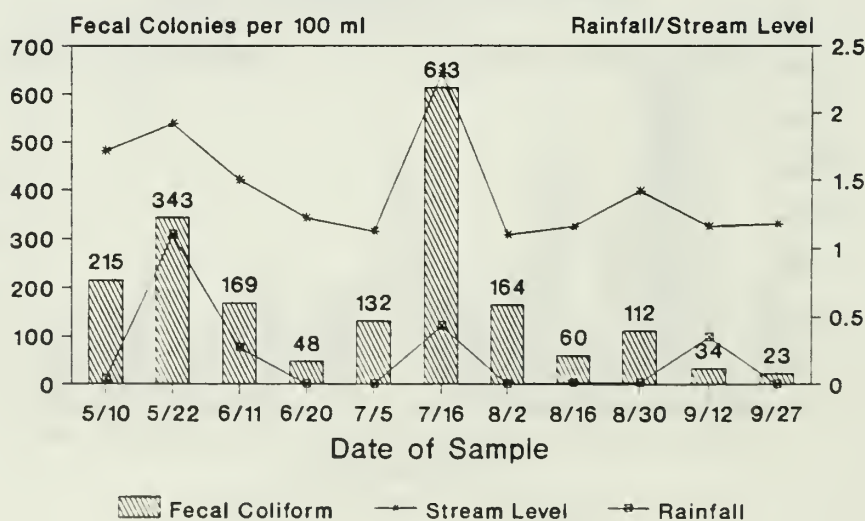


Figure 8. Fecal Coliform Data for
Laurel Creek @ Quinnimont

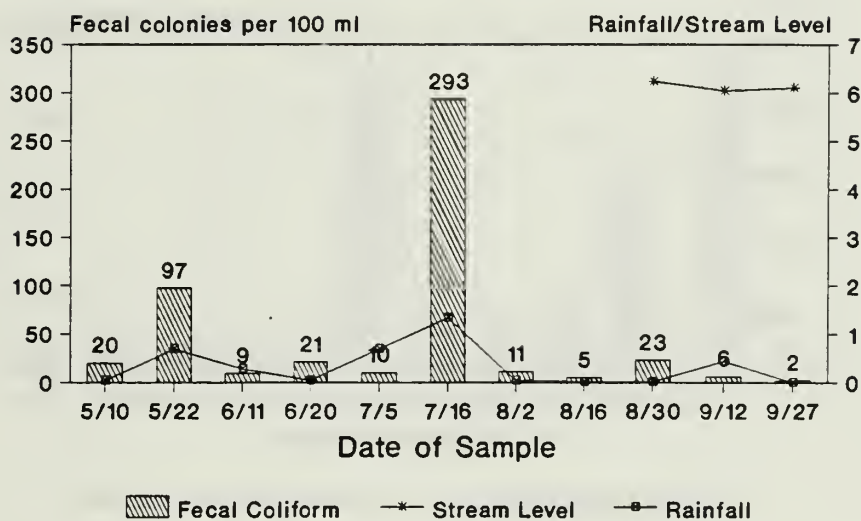


Figure 9. Fecal Coliform Data for
New River @ Prince

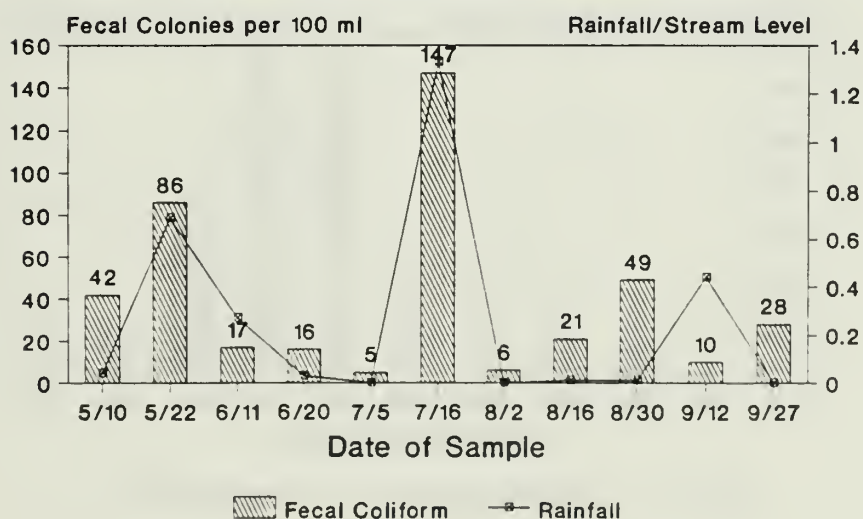


Figure 10. Fecal Coliform Data for Piney Creek

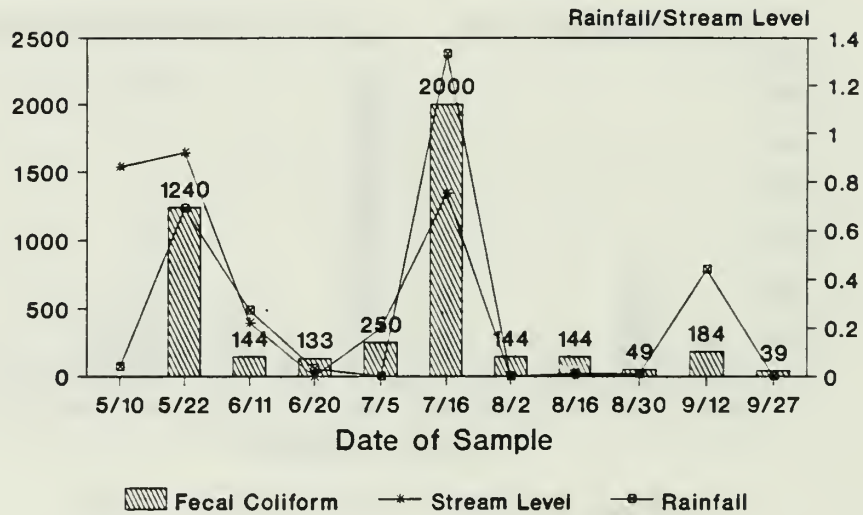


Figure 11. Fecal Coliform Data for Slater's Creek

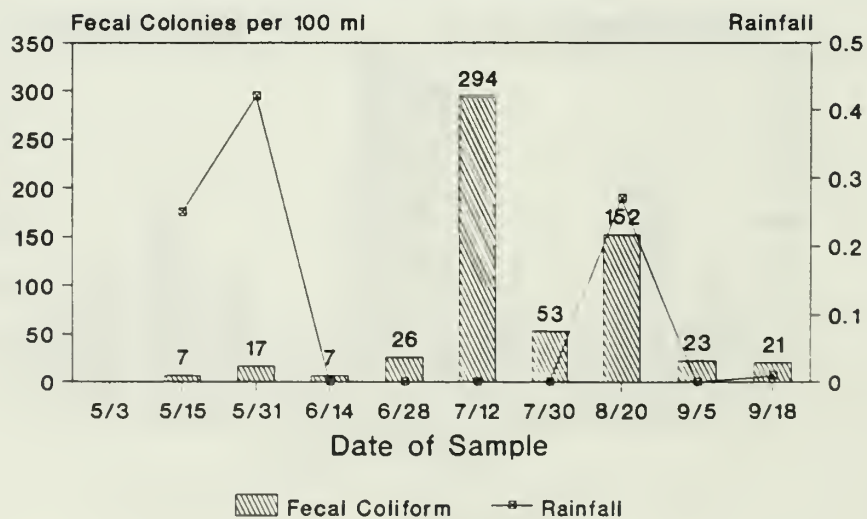


Figure 12. Fecal Coliform Data for Dunloup Creek

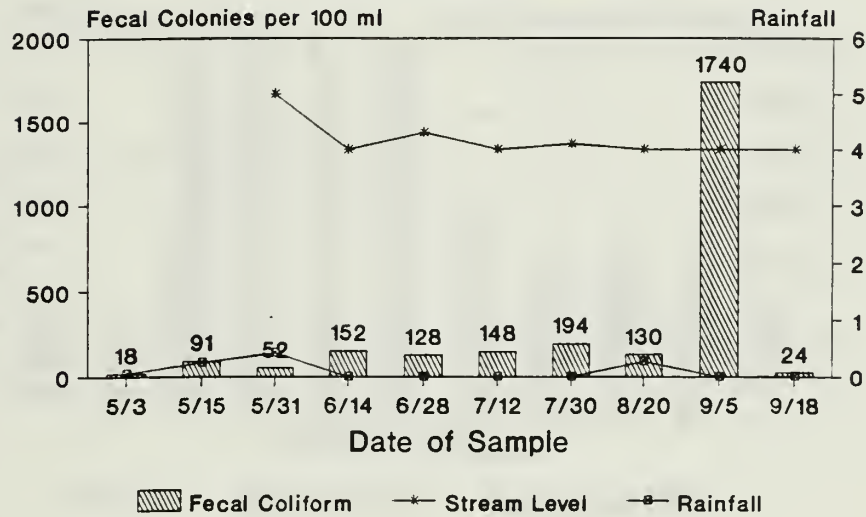


Figure 13. Fecal Coliform Data for New River @ Thurmond

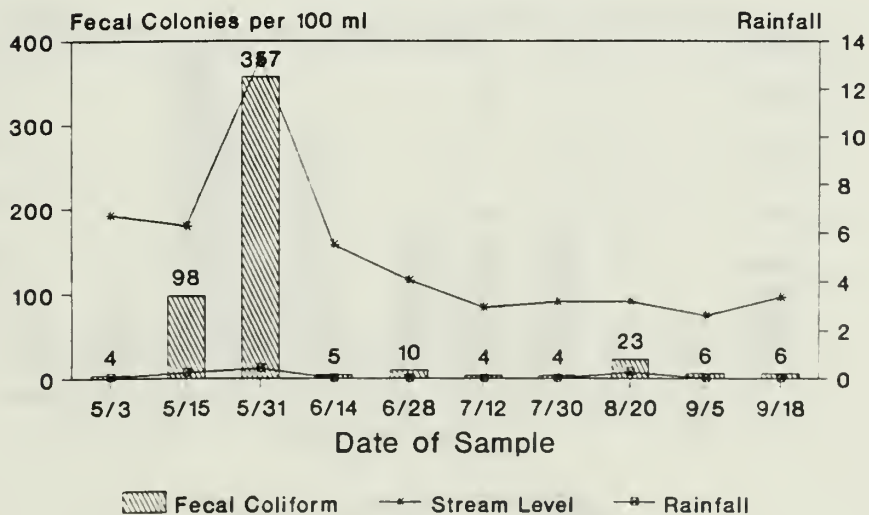


Figure 14. Fecal Coliform Data for Arbuckle Creek

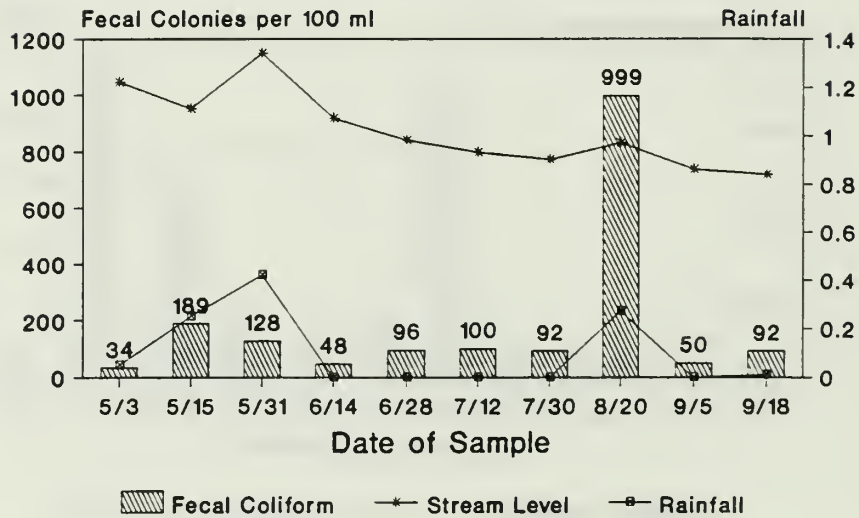


Figure 15. Fecal Coliform Data for Mann's Creek

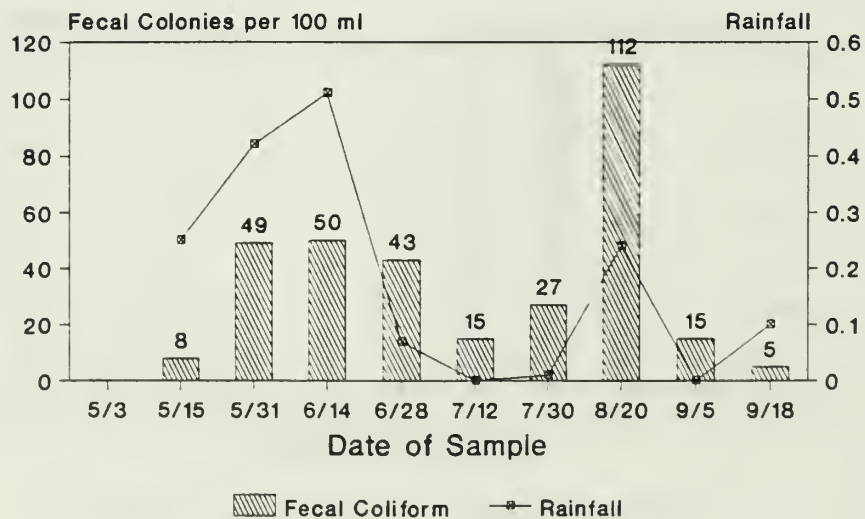


Figure 16. Fecal Coliform Data for Coal Run Creek

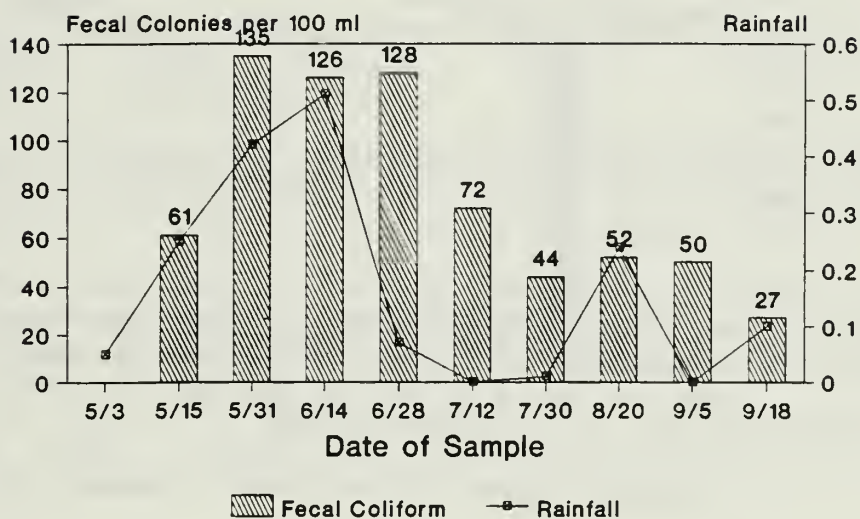


Figure 17. Fecal Coliform Data for Keeney's Creek

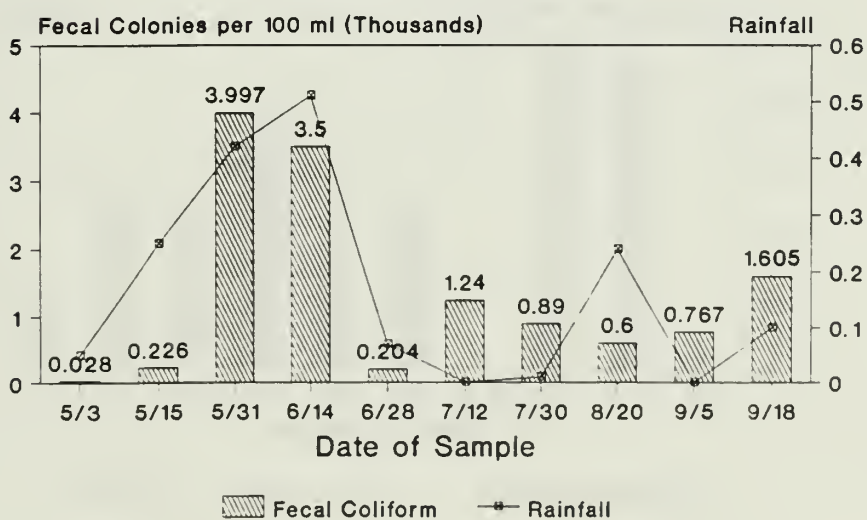


Figure 18. Fecal Coliform Data for
New River @ Fayette Station

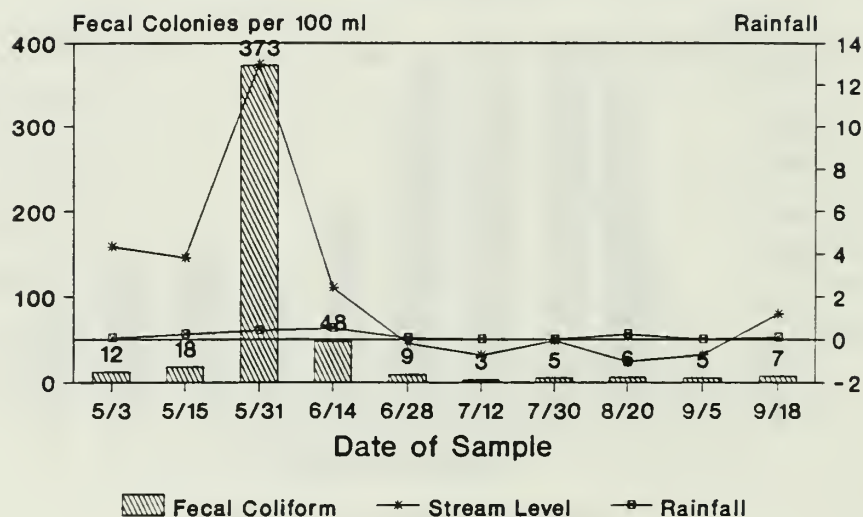
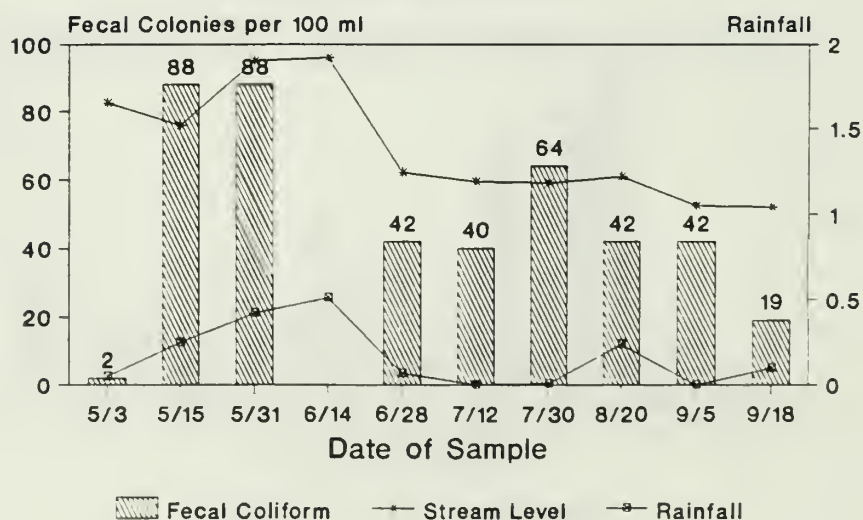


Figure 19. Fecal Coliform Data for
Wolf Creek



LITERATURE CITED

EPA. Monitoring the Environment, p. 71.

Greenberg, Arnold E.. R.R. Trussell, L.S. Clesceri. 1985.
Standard Methods for the Examination of Water and Wastewater. 16th. edition. American Public Health Association. Washington D.C.

Microbiological Methods for Monitoring the Environment: Water and Wastes, U.S. Environmental Protection Agency Report No. EPA-600/8-78-017, p. 30.

West Virginia Department of Natural Resources, Division of Water Resources, Monitoring Branch, New River Gorge National River, Fecal Coliform Study: April-September, 1987-1988.

Wood, Douglas McClure, New River Gorge National River Water Quality Study, 1990 (West Virginia Division of Natural Resources, Water Resources Section, 1990), ii.

APPENDICES

This section contains the appendices referred to in the paper. In Appendix 5 the 0.0 values for dissolved oxygen are not accurate. The data base program printed zeros in place of blank spaces. The 0.0 represent periods when the DO meter was being serviced. The following is a key to the abbreviations used in Appendix 5.

SITE_NO	Site Number
SITE_NAME	Site Name
DATE	Date
TIME	Time
WATER_TEMP	Water Temperature (in celsius)
F_100ML	Fecal coliform colonies per 100 mls of sample
AIR_TEMP	Air Temperature (in celsius)
PH	pH
STREAM_LVL	Stream level
WATER_COND	Water condition
INCUBATION	The amount of time the fecal coliform colonies were incubated in the hot water bath
DISS_OXYGN	Dissolved oxygen
DILUTIONS	The dilutions used to get the accepted fecal coliform colony reading (20 - 60)
WEATHER	Weather (referred to in appendix - 2)
PRECIP_48	Precipitation in the 48 hour period preceding the date listed

Appendix 1

This is an example sheet of the data collected when each site was sampled. Conductivity units are micro ohms. The top numbers in the dilution column are the milliliters of sample used and the numbers below them are the fecal coliform colony count.

SAMPLE SITE	DATE	SAMPLE TIME	WATER TEMP	AIR TEMP	pH	STAGE LEVEL	WATER COND	DO	WEATHER	CONDUCTIVITY	DILUTIONS	FECALS /100ML	COMMENTS
9. PINEY CREEK @ McCREERY	8/21/91	8:20	20°C	15°C	7.0	8.28	L, M, C	8.4	overcast	358	10 5 125 66	Est. 1320	
8. NEW RIVER @ PRINCE	8/21/91	8:40	26°C	18°C	7.9	1.9	L, M, C	7.2	overcast	150	100 150 12 24	16/100	
7. LAUREL CREEK @ QUINNMT	8/21/91	9:00	19°C	18°C	7.7	5.75	L, M, C	8.8	overcast drizzle	145	100 50 2 2	Est. 2	
6. MEADOW CREEK	8/21/91	10:00	21°C	19°C	7.9	0.86	L, M, C	7.8	overcast	225	30 20 11 15	Est. 75	
5. LICK CREEK	8/21/91	10:15	20°C	22°C	7.7	1.40	L, S, C	5.7	Partly Cloudy	400	35 25 26 12	26	
4. NEW RIVER @ SANDSTONE	8/21/91	10:50	24.5°C	24°C	8.7	1.90	L, M, C	6.4	Sunny slightly overcast	140	.2 10 0 7	Est. 70	Hinton STP no longer on line (old STP)
3. NEW RIVER @ HINT STP	8/21/91	12:30	25°C	28°C	8.9	1.90	L, M, C	6.9	Sunny Part cloudy	150	100 50 19 4	Est. 19	
2. MADAM CREEK	8/21/91	1:00	22°C	27°C	8.1	—	L, S, C	4.7	Sunny slightly over	280	1 5 193 120	Est. 24,000	
1. NEW RIVER @ HINTN VC	8/21/91	11:15	26°C	22°C	8.0	1.90	L, M, C	5.8	overcast	155	150 100 47 26	Est. 36.5	
									Pre-control Post-control		0 0 0 0		
HINTON GAGE	1.9	OTHER OBSERVATIONS AND COMMENTS:											
PRECIP W/IN 48 HOURS	0.0												

TIME IN: 5:20 PM
TIME OUT: 4:15 PM

Appendix 2

This chart was used to determine weather codes when sampling.

WEATHER CODES

I. CLOUD AMOUNT

CLR CLEAR: LESS THAN 1% SKY COVER

SCT SCATTERED: 1% TO 50% SKY COVER

BKN BROKEN: 60% TO 90% SKY COVER

OVC OVERCAST: MORE THAN 90% SKY COVER

- THIN (WHEN PREFIXED TO THE ABOVE SYMBOLS)

-X PARTIAL OBSCURATION: 1% TO LESS THAN 10% SKY HIDDEN BY PRECIPITATION OR OBSTRUCTION TO VISION

X OBSCURATION: 10% SKY HIDDEN BY PRECIPITATION OR OBSTRUCTION TO VISION

II. PHYSICAL WEATHER:

A. WEATHER AND OBSTRUCTION TO VISION SYMBOLS

A HAIL

BS BLOWING SNOW

D DUST

F FOG

GF GROUND FOG

H HAZE

K SMOKE

L DRIZZLE

R RAIN

RW RAIN SHOWERS

S SNOW

SW SNOW SHOWERS

T THUNDERSTORMS

T+ SEVERE THUNDERSTORMS

ZL FREEZING DRIZZLE

ZR FREEZING RAIN

B. PRECIPITATION INTENSITIES

(-) LIGHT

(NO SIGN) MODERATE

(+) HEAVY

Stream Conditions

First letter
(volume):

L = low
N = normal
H = high

Second letter(s)
(velocity):

SL = slow
M = moderate
SW = swift

Third letter(s)
(opacity):

C = clear
MI = milky
MR = murky

Phone numbers used to determine New River stage levels at Thurmond and Hinton.

GAUGES

Following is a list of non-battery operated gauges for several area rivers. The WVWA answering service will carry levels of selected rivers when they are at paddling levels.

<u>PHONE</u>	<u>RIVERS</u>	<u>COMMENTS</u>
465-0493	NEW (THURMOND)	Beeper gauge, 24-hour continuous update.
466-0156	NEW (Bluestone Dam release)	Updated 8:00 AM each day.
529-5127	NEW & GAULEY Watersheds	Updated 10:00 AM each day.

(Stage, flow & 24-hour change on all gauging stations on Bluestone, Greenbrier, Cranberry, Elk & Meadow, plus New & Gauley.)

GAUGE CORRELATIONS FOR NEW:

<u>Fayette Sta. (visual)</u>	<u>Hinton</u>	<u>Thurmond</u>	<u>Flow. cfs</u>
-2	0.45	1.8	1070
-1	0.6	2.8	1700
0	0.8	3.4	2440
1	1.0	4.4	3350
2	1.2	5.1	4440
3	1.4	5.7	5820
4	1.7	6.5	7550
5	2.0	7.2	9550
6	2.4	8.0	11400
7	2.7	8.7	14100
8	3.0	9.5	17200
9	3.4	10.3	20200
10	3.7	11.2	23800

Appendix 4

Table of fecal coliform values for the New River Gorge National River Fecal Coliform Study, April-September, 1990. Stage level and 48 hour precipitation are listed with corresponding dates and sample location.

SITE NO	SITE NAME	DATE	FC_100ML	STREAM_LVL	PRECIP_48H
01M	NEW RIVER @ BINTON VC	05/10/90	23	3.6	0.04*
01M	NEW RIVER @ BINTON VC	05/22/90	33	2.1	1.1
01M	NEW RIVER @ BINTON VC	06/11/90	9	2.7	0.27
01M	NEW RIVER @ BINTON VC	06/20/90	25	2.3	0.00
01M	NEW RIVER @ BINTON VC	07/05/90	17	2.2	0.00
01M	NEW RIVER @ BINTON VC	07/16/90	0	4.3	0.43
01M	NEW RIVER @ BINTON VC	08/02/90	21	2.0	0.00
01M	NEW RIVER @ BINTON VC	08/16/90	28	1.9	0.01
01M	NEW RIVER @ BINTON VC	08/30/90	12	2.3	TRACE (10.00 - 0.01)
01M	NEW RIVER @ BINTON VC	09/12/90	15	1.3	0.35
01M	NEW RIVER @ BINTON VC	09/27/90	8	1.9	0.00
02T	MADAM'S CREEK	05/10/90	477		0.04
02T	MADAM'S CREEK	05/22/90	1300	N/A	1.1
02T	MADAM'S CREEK	06/11/90	510	N/A	0.27
02T	MADAM'S CREEK	06/20/90	833	N/A	0.00
02T	MADAM'S CREEK	07/05/90	1333	N/A	0.00
02T	MADAM'S CREEK	07/16/90	3500	N/A	0.43
02T	MADAM'S CREEK	08/02/90	375	N/A	0.00
02T	MADAM'S CREEK	08/16/90	4000	N/A	0.01
02T	MADAM'S CREEK	08/30/90	2625		TRACE (10.00 - 0.01)
02T	MADAM'S CREEK	09/12/90	5400	N/A	0.35
02T	MADAM'S CREEK	09/27/90	1500	N/A	0.00
03M	NEW RIVER @ BINTON SEWAGE TP	05/10/90	56	3.6	0.04
03M	NEW RIVER @ BINTON SEWAGE TP	05/22/90	999	3.1	1.1
03M	NEW RIVER @ BINTON SEWAGE TP	06/11/90	999	2.7	0.27
03M	NEW RIVER @ BINTON SEWAGE TP	06/20/90	999	2.3	0.00
03M	NEW RIVER @ BINTON SEWAGE TP	07/05/90	50	2.2	0.00
03M	NEW RIVER @ BINTON SEWAGE TP	07/16/90	933	4.3	0.43
03M	NEW RIVER @ BINTON SEWAGE TP	08/02/90	200	2.0	0.00
03M	NEW RIVER @ BINTON SEWAGE TP	08/16/90	7	1.9	0.01
03M	NEW RIVER @ BINTON SEWAGE TP	08/30/90	16400	2.3	TRACE (10.00 - 0.01)
03M	NEW RIVER @ BINTON SEWAGE TP	09/12/90	2133	1.9	0.35
03M	NEW RIVER @ BINTON SEWAGE TP	09/27/90	999	1.9	0.00
04M	NEW RIVER @ SANDSTONE FALLS	05/10/90	8	N/A	0.04
04M	NEW RIVER @ SANDSTONE FALLS	05/22/90	134	N/A	1.1
04M	NEW RIVER @ SANDSTONE FALLS	06/11/90	13	N/A	0.27
04M	NEW RIVER @ SANDSTONE FALLS	06/20/90	49	N/A	0.00
04M	NEW RIVER @ SANDSTONE FALLS	07/05/90	46	N/A	0.00
04M	NEW RIVER @ SANDSTONE FALLS	07/16/90	0	N/A	0.43
04M	NEW RIVER @ SANDSTONE FALLS	08/02/90	32	N/A	0.00
04M	NEW RIVER @ SANDSTONE FALLS	08/16/90	47	N/A	0.01
04M	NEW RIVER @ SANDSTONE FALLS	08/30/90	13		TRACE (10.00 - 0.01)
04M	NEW RIVER @ SANDSTONE FALLS	09/12/90	30	N/A	0.35
04M	NEW RIVER @ SANDSTONE FALLS	09/27/90	21	N/A	0.00
05T	LICK CREEK	05/10/90	155	2.32	0.04
05T	LICK CREEK	05/22/90	450	2.60	1.1
05T	LICK CREEK	06/11/90	129	2.0	0.27
05T	LICK CREEK	06/20/90	73	1.70	0.00
05T	LICK CREEK	07/05/90	112	1.62	0.00
05T	LICK CREEK	07/16/90	790	2.56	0.43
05T	LICK CREEK	08/02/90	8		0.00
05T	LICK CREEK	08/16/90	25	1.72	0.01
05T	LICK CREEK	08/30/90	92	1.90	TRACE (10.00 - 0.01)
05T	LICK CREEK	09/12/90	42	1.70	0.35
05T	LICK CREEK	09/27/90	17		0.00
06T	MEADOW CREEK	05/10/90	215	1.72	0.04
06T	MEADOW CREEK	05/22/90	243	1.92	1.10
06T	MEADOW CREEK	06/11/90	163	1.50	0.27
06T	MEADOW CREEK	06/20/90	48	1.22	0.00
06T	MEADOW CREEK	07/05/90	132	1.12	0.00
06T	MEADOW CREEK	07/16/90	613	2.30	0.43
06T	MEADOW CREEK	08/02/90	164	1.10	0.00
06T	MEADOW CREEK	08/16/90	60	1.16	0.01
06T	MEADOW CREEK	08/30/90	112	1.42	TRACE (10.00 - 0.01)
06T	MEADOW CREEK	09/12/90	34	1.16	0.35
06T	MEADOW CREEK	09/27/90	23	1.18	0.00
06T	MEADOW CREEK	05/10/90	20	*	0.04
06T	MEADOW CREEK	05/22/90	97	N/A	0.89
06T	MEADOW CREEK	06/11/90	9	N/A	0.27
06T	MEADOW CREEK	06/20/90	21	N/A	0.03
06T	MEADOW CREEK	07/05/90	10	N/A	0.69
06T	MEADOW CREEK	07/16/90	293	N/A	1.33
06T	MEADOW CREEK	08/02/90	11	N/A	0.03
06T	MEADOW CREEK	08/16/90	5	N/A	0.01
06T	MEADOW CREEK	08/30/90	23	6.24	0.01
06T	MEADOW CREEK	09/12/90	6	6.03	0.44
06T	MEADOW CREEK	09/27/90	2	6.10	0.00
06T	MEADOW CREEK	05/10/90	42		0.04
06T	MEADOW CREEK	05/22/90	86	N/A	0.69
06T	MEADOW CREEK	06/11/90	17	N/A	0.27
06T	MEADOW CREEK	06/20/90	16	N/A	0.03
06T	MEADOW CREEK	07/05/90	5	N/A	0
06T	MEADOW CREEK	07/16/90	147	N/A	1.33
06T	MEADOW CREEK	08/02/90	6	N/A	0.00
06T	MEADOW CREEK	08/16/90	21	N/A	0.01
06T	MEADOW CREEK	08/30/90	49	N/A	0.01
06T	MEADOW CREEK	09/12/90	10	N/A	0.44
06T	MEADOW CREEK	09/27/90	28	N/A	0.00
06T	MEADOW CREEK	05/10/90	0	0.86	0.04
06T	MEADOW CREEK	05/22/90	1240	.92	0.69
06T	MEADOW CREEK	06/11/90	144	0.22	0.27
06T	MEADOW CREEK	06/20/90	133	0.00	0.03
06T	MEADOW CREEK	07/05/90	250	0.20	0.00
06T	MEADOW CREEK	07/16/90	2000	.75	1.33
06T	MEADOW CREEK	08/02/90	144	< 0.00	0
06T	MEADOW CREEK	08/16/90	144	< 0.00	.01
06T	MEADOW CREEK	08/30/90	49	8.34	.01
06T	MEADOW CREEK	09/12/90	184	8.56	0.44
06T	MEADOW CREEK	09/27/90	39	8.16	0
06T	MEADOW CREEK	05/03/90	0		0.25
06T	MEADOW CREEK	05/15/90	7		.42
06T	MEADOW CREEK	05/31/90	17		0.00
06T	MEADOW CREEK	06/14/90	7		0.00
06T	MEADOW CREEK	06/28/90	26		0.06
06T	MEADOW CREEK	07/12/90	294		0.00
06T	MEADOW CREEK	07/30/90	53		0.27
06T	MEADOW CREEK	08/20/90	152		0.00
06T	MEADOW CREEK	09/05/90	23		0.01
06T	MEADOW CREEK	09/18/90	21		.05
06T	MEADOW CREEK	05/03/90	18		.25
06T	MEADOW CREEK	05/15/90	91		.42
06T	MEADOW CREEK	05/31/90	52	5	0.60
06T	MEADOW CREEK	06/14/90	152	4	0.00
06T	MEADOW CREEK	06/28/90	128	4.3	0.00
06T	MEADOW CREEK	07/12/90	148	4	0
06T	MEADOW CREEK	07/30/90	194	4.1	0
06T	MEADOW CREEK	08/20/90	130	4	0.2

SITE NO	SITE NAME	DATE	FC_100ML	STREAM_LVL	PRECIP_48H	SITE NO	SITE NAME	DATE	FC_100ML	STREAM_LVL	PRECIP_48H
11T	DUNLOP CREEK	05/05/90	1740	4	0.00	17M	NEW RIVER @ FAYETTE STATION	08/22/90	6	-1.04	0.24
11T	DUNLOP CREEK	05/18/90	24	4	0.01	17M	NEW RIVER @ FAYETTE STATION	09/04/90	5	-0.69	0.00
12M	NEW RIVER @ THURMOND	05/03/90	4	6.74	.05	17M	NEW RIVER @ FAYETTE STATION	09/17/90	7	1.19	0.10
12M	NEW RIVER @ THURMOND	05/15/90	98	6.29	0.25	18T	WOLF CREEK	05/03/90	2	1.65	.05
12M	NEW RIVER @ THURMOND	05/31/90	357	13.22	.42	18T	WOLF CREEK	05/15/90	88	1.52	.25
12M	NEW RIVER @ THURMOND	06/14/90	5	5.62	0.00	18T	WOLF CREEK	05/31/90	88	1.90	.42
12M	NEW RIVER @ THURMOND	06/28/90	10	4.07	0	18T	WOLF CREEK	06/12/90	0	1.92	.51
12M	NEW RIVER @ THURMOND	07/12/90	4	2.95	0.00	18T	WOLF CREEK	07/02/90	42	1.24	.07
12M	NEW RIVER @ THURMOND	07/26/90	4	3.18	0.00	18T	WOLF CREEK	07/10/90	40	1.19	0.00
12M	NEW RIVER @ THURMOND	08/20/90	23	3.18	0.27	18T	WOLF CREEK	08/01/90	64	1.18	.01
12M	NEW RIVER @ THURMOND	09/05/90	6	2.61	0.00	18T	WOLF CREEK	08/22/90	42	1.22	0.24
12M	NEW RIVER @ THURMOND	09/18/90	6	3.37	0.01	18T	WOLF CREEK	09/04/90	42	1.05	0.00
13T	ARBUCLE CREEK	05/03/90	34	1.22	.05	18T	WOLF CREEK	09/17/90	19	1.04	0.10
13T	ARBUCLE CREEK	05/15/90	189	1.11	.25	19T	MARR BRANCH	05/03/90	58	0.82	.05
13T	ARBUCLE CREEK	05/31/90	125	1.34	.42	19T	MARR BRANCH	05/15/90	182	0.62	.25
13T	ARBUCLE CREEK	06/14/90	45	1.07	0.00	19T	MARR BRANCH	05/31/90	116	1.06	.42
13T	ARBUCLE CREEK	06/28/90	96	.98	0	19T	MARR BRANCH	06/12/90	0	1.26	.51
13T	ARBUCLE CREEK	07/12/90	100	0.93	0.00	19T	MARR BRANCH	07/02/90	874	0.59	.07
13T	ARBUCLE CREEK	07/26/90	92	0.90	0	19T	MARR BRANCH	07/10/90	1960	.55	0
13T	ARBUCLE CREEK	08/20/90	999	.97	0.27	19T	MARR BRANCH	08/01/90	3300	.61	.01
13T	ARBUCLE CREEK	09/05/90	50	0.86	0.00	19T	MARR BRANCH	08/22/90	850	.67	0.24
13T	ARBUCLE CREEK	09/18/90	92	0.84	0.01	19T	MARR BRANCH	09/04/90	6800	.51	0.00
14T	MANN'S CREEK	05/03/90	0			19T	MARR BRANCH	09/17/90	667	7.56	0
14T	MANN'S CREEK	05/15/90	8		.25				90692		
14T	MANN'S CREEK	05/31/90	45		.42						
14T	MANN'S CREEK	06/12/90	50		.51						
14T	MANN'S CREEK	07/02/90	43		.07						
14T	MANN'S CREEK	07/10/90	15		0						
14T	MANN'S CREEK	08/01/90	27		.01						
14T	MANN'S CREEK	06/22/90	112		0.24						
14T	MANN'S CREEK	09/04/90	15		0.00						
14T	MANN'S CREEK	09/17/90	5		0.10						
15T	COAL RUN	05/03/90	0		.05						
15T	COAL RUN	05/15/90	61		.25						
15T	COAL RUN	05/31/90	135		.42						
15T	COAL RUN	06/12/90	126		.51						
15T	COAL RUN	07/02/90	128		.07						
15T	COAL RUN	07/10/90	72		0						
15T	COAL RUN	08/01/90	44		.01						
15T	COAL RUN	08/22/90	52		0.24						
15T	COAL RUN	09/04/90	50		0.00						
15T	COAL RUN	09/17/90	27		0.10						
16T	KEENEY'S CREEK	05/03/90	28		.05						
16T	KEENEY'S CREEK	05/15/90	226		.25						
16T	KEENEY'S CREEK	05/31/90	3997		.42						
16T	KEENEY'S CREEK	06/12/90	3500		.51						
16T	KEENEY'S CREEK	07/02/90	204		.07						
16T	KEENEY'S CREEK	07/10/90	1240		0						
16T	KEENEY'S CREEK	08/01/90	890		.01						
16T	KEENEY'S CREEK	08/22/90	600		0.24						
16T	KEENEY'S CREEK	09/04/90	767		0.00						
16T	KEENEY'S CREEK	09/17/90	1605		0.10						
17M	NEW RIVER @ FAYETTE STATION	05/03/90	12	4.32	.05						
17M	NEW RIVER @ FAYETTE STATION	05/15/90	18	3.8	.25						
17M	NEW RIVER @ FAYETTE STATION	05/31/90	373	13.00	.42						
17M	NEW RIVER @ FAYETTE STATION	06/12/90	48	2.4	.51						
17M	NEW RIVER @ FAYETTE STATION	07/02/90	9	-1.19	.07						
17M	NEW RIVER @ FAYETTE STATION	07/10/90	5	-1.71	0.00						

Appendix 5

Raw data for the NERI fecal coliform Study, April-September, 1990.

IN	NEW RIVER @ HINTON VC	05/10/30 1:20	0.0	0	0	0.00	0.0	22:15	0.00	50ML:7	50ML:16	PARTLY SUNNY, WINDY	0.04*
IN	NEW RIVER @ HINTON VC	05/22/30 11:52	18.5	0.0	23	58	0.00	22:20	0.00	50ML:17	50ML:16	VERY CLOUDY	1.1
IN	NEW RIVER @ HINTON VC	05/11/30 11:25	0.0	9	54	0.00	2.7	22:15	0.00	50ML:3	50ML:6	PARTLY SUNNY	0.27
IN	NEW RIVER @ HINTON VC	06/20/30 11:20	24.0	29	73	0.00	2.3	23:20	0.00	50ML:17	50ML:12	PARTLY CLOUDY	0.00
IN	NEW RIVER @ HINTON VC	07/05/30 11:10	28.0	17	30	0.00	2.2	23:00	0.00	10ML:1	25ML:5	SUNNY, BUM1D	0.00
IN	NEW RIVER @ HINTON VC	07/16/30 11:15	25.0	0	72	7.73	4.3	23:45	0.00	50ML:NO COUNT		SUNNY	0.43
IN	NEW RIVER @ HINTON VC	08/02/30 10:05	26.0	21	67	8.80	2.0	22:00	0.00	50ML:12	50ML:9	PARTLY CLOUDY	0.00
IN	NEW RIVER @ HINTON VC	08/16/30 9:45	25.0	28	0	0.00	1.9	22:15	0.00	100ML:30	100ML:25	CLOUDY	0.01
IN	NEW RIVER @ HINTON VC	08/30/30 11:40	0.0	12	75	0.00	2.3	22:41	0.00	100ML:15	50ML:2	CLOUDY	0.01
IN	NEW RIVER @ HINTON VC	09/12/30 12:40	27.1	15	78	7.73	1.9	23:00	0.00	100ML:12	150ML:9	SUNNY	0.35
IN	NEW RIVER @ HINTON VC	09/27/30 11:00	0.0	8	68	0.00	1.9	22:15	0.00	50ML:256	50ML:221	PARTLY SUNNY, WINDY	0.04
2T	MADAM'S CREEK	05/10/30 1:00	0.0	477	57	0.00		22:15	0.00	10ML:130	25ML:TNTC	CLOUDY, RAIN	1.1
2T	MADAM'S CREEK	05/22/30 12:50	18.5	1300	56	0.00	N/A	22:20	0.00	10ML:51	25ML:133	PARTLY CLOUDY	0.27
2T	MADAM'S CREEK	06/11/30 10:30	19.0	510	62	0.00	N/A	23:20	0.00	5ML:6	10ML:64	PARTLY CLOUDY	0.00
2T	MADAM'S CREEK	06/20/30 10:25	21.0	833	70	0.00	N/A	23:00	0.00	1ML:12	3ML:40	HAZY SUNSHINE	0.00
2T	MADAM'S CREEK	07/05/30 10:20	24.0	1333	78	0.00	N/A	23:45	0.00	1ML:35	3ML:123	SUNNY	0.43
2T	MADAM'S CREEK	07/16/30 10:55	20.0	3500	71	7.82	N/A	22:00	0.00	1ML:3	3ML:12	PARTLY CLOUDY	0.00
2T	MADAM'S CREEK	08/02/30 10:50	23.0	375	70	7.81	N/A	22:15	0.00	5ML:200	20ML:TNTC	CLOUDY	0.01
2T	MADAM'S CREEK	08/16/30 10:10	23.0	4000	0	7.65	N/A	22:15	0.00	1ML:29	3ML:76	PARTLY SUNNY	TRACE (0.00 - 0.01)
2T	MADAM'S CREEK	08/30/30 11:30	0.0	2625	75	0.00		23:00	0.00	2ML:98	1ML:54	SUNNY	0.35
2T	MADAM'S CREEK	09/12/30 12:12	25.0	3400	72	7.81	N/A	22:41	0.00	1ML:14	2ML:30	SUNNY	0.00
2T	MADAM'S CREEK	09/27/30 11:45	0.0	1500	72	0.00	N/A	23:00	0.00	50ML:28	50ML:31	PARTLY SUNNY, WINDY	0.04
3M	NEW RIVER @ BINTON SEWAGE TP	05/10/30 12:45	0.0	56	63	0.00	3.6	22:15	0.00	50ML:TNTC	50ML:TNTC	VERY CLOUDY	1.1
3M	NEW RIVER @ BINTON SEWAGE TP	05/22/30 11:30	19.0	999	54	0.00	3.1	22:20	0.00	10ML:TNTC	25ML:TNTC	PARTLY SUNNY	0.27
3M	NEW RIVER @ BINTON SEWAGE TP	06/11/30 10:10	24.0	999	61	0.00	2.7	22:15	0.00	5ML:TNTC	10ML:TNTC	PARTLY CLOUDY	0.00
3M	NEW RIVER @ BINTON SEWAGE TP	06/20/30 10:10	24.0	999	69	0.00	2.3	23:20	0.00	1ML:1	3ML:1	HAZY SUNSHINE	0.00
3M	NEW RIVER @ BINTON SEWAGE TP	07/05/30 10:00	26.0	50	77	0.00	2.2	23:00	0.00	1ML:2	3ML:6	PARTLY CLOUDY	0.43
3M	NEW RIVER @ BINTON SEWAGE TP	07/16/30 10:50	25.0	933	71	7.65	4.3	23:45	0.00	5ML:TNTC	20ML:TNTC	CLOUDY	0.01
3M	NEW RIVER @ BINTON SEWAGE TP	08/02/30 9:50	24.0	200	67	7.64	2.0	22:00	0.00	1ML:164	3ML:TNTC	PARTLY SUNNY	TRACE (0.00 - 0.01)
3M	NEW RIVER @ BINTON SEWAGE TP	08/16/30 9:30	24.0	7	72	7.56	1.9	22:15	0.00	50ML:9	25ML:7	PARTLY CLOUDY	0.35
3M	NEW RIVER @ BINTON SEWAGE TP	08/30/30 10:25	0.0	16400	70	0.00	2.3	22:41	0.00	50ML:TNTC	100ML:TNTC	SUNNY	0.00
3M	NEW RIVER @ BINTON SEWAGE TP	09/12/30 11:07	25.0	2133	75	7.56	1.9	22:15	0.00	50ML:1	50ML:7	PARTLY CLOUDY	0.04
3M	NEW RIVER @ BINTON SEWAGE TP	09/27/30	0.0	999	0	0.00	1.9	22:15	0.00	50ML:56	50ML:72	RAINY	1.1
3M	NEW RIVER @ SANDSTONE FALLS	05/10/30 12:00	0.0	8	55	0.00	N/A	22:20	0.00	50ML:5	50ML:8	PARTLY SUNNY	0.27
3M	NEW RIVER @ SANDSTONE FALLS	05/22/30 12:30	19.0	134	55	0.00	N/A	22:15	0.00	50ML:23	50ML:26	PARTLY CLOUDY	0.00
3M	NEW RIVER @ SANDSTONE FALLS	06/11/30 11:00	24.0	13	64	0.00	N/A	23:20	0.00	50ML:23	50ML:23	HAZY SUNSHINE	0.00
3M	NEW RIVER @ SANDSTONE FALLS	06/20/30 10:50	23.5	49	72	0.00	N/A	23:00	0.00	50ML:22	50ML:10	PARTLY CLOUDY	0.43
3M	NEW RIVER @ SANDSTONE FALLS	07/05/30 10:45	27.0	46	79	0.00	N/A	23:45	0.00	100ML:52	100ML:42	CLOUDY	0.01
3M	NEW RIVER @ SANDSTONE FALLS	07/16/30 10:17	23.5	0	69	1.70	N/A	22:00	0.00	50ML:6	50ML:7	SUNNY	TRACE (0.00 - 0.01)
3M	NEW RIVER @ SANDSTONE FALLS	08/02/30 11:15	25.5	32	71	8.47	N/A	22:15	0.00	50ML:11	50ML:19	PARTLY SUNNY	0.35
3M	NEW RIVER @ SANDSTONE FALLS	08/15/30 10:35	25.0	47	75	7.87	N/A	22:41	0.00	100ML:14	150ML:32	CLOUDY, WINDY	0.04
3M	NEW RIVER @ SANDSTONE FALLS	09/12/30 11:50	26.7	30	77	8.91	N/A	22:15	0.00	10ML:45	25ML:125	DRIZZLE, VERY CLOUDY	1.1
3M	NEW RIVER @ SANDSTONE FALLS	09/27/30 11:25	0.0	21	70	0.00	2.32	23:15	0.00	50ML:60	50ML:69	CLOUDY	0.27
ST	LICK CREEK	05/10/30 11:05	0.0	155	55	0.00	N/A	23:20	0.00	5ML:3	10ML:8	CLOUDY, FOG	0.00
ST	LICK CREEK	05/22/30 10:20	19.0	450	55	0.00	2.60	23:45	0.00	10ML:14	25ML:28	SUNNY	0.00
ST	LICK CREEK	06/11/30 9:30	19.0	129	53	0.00	2.0	22:00	0.00	10ML:79	20ML:128	SUNNY	0.43
ST	LICK CREEK	06/20/30 9:10	20.0	73	65	0.00	1.70	23:00	0.00	10ML:0	25ML:2	PARTLY CLOUDY	0.00
ST	LICK CREEK	07/05/30 9:30	22.0	112	76	0.00	1.62	22:15	0.00	50ML:17	50ML:8	CLOUDY	0.01
ST	LICK CREEK	07/15/30 9:50	20.0	790	68	7.92	2.56	22:41	0.00	25ML:12	10ML:3	SUNNY	0.35
ST	LICK CREEK	08/02/30 9:20	20.0	8	65	8.15	*	22:15	0.00	100ML:14	50ML:11	FOG	0.00
ST	LICK CREEK	08/16/30 9:00	22.0	25	70	8.15	1.72	22:15	0.00	50ML:103	50ML:112	PARTLY CLOUDY	0.04
ST	LICK CREEK	08/30/30 9:45	0.0	92	67	0.00	1.30	22:41	0.00	10ML:41	25ML:73	VERY CLOUDY, RAIN	1.10
ST	LICK CREEK	09/12/30 10:34	22.0	43	72	8.16	1.70	22:15	0.00	10ML:51	25ML:3	CLOUDY, FISHING	0.27
ST	LICK CREEK	09/27/30 10:20	0.0	17	66	0.00		22:15	0.00	50ML:103	50ML:112	PARTLY CLOUDY	0.04
ST	MEADOW CREEK	05/10/30 10:40	0.0	215	56	0.00	1.72	22:15	0.00	10ML:41	25ML:73	VERY CLOUDY, RAIN	1.10
ST	MEADOW CREEK	05/22/30 10:55	18.0	343	54	0.00	1.32	22:15	0.00	10ML:51	25ML:3	CLOUDY	0.27
ST	MEADOW CREEK	06/11/30 9:45	16.0	159	53	0.00	1.50	22:15	0.00	50ML:103	50ML:112	PARTLY CLOUDY	0.04

SITE NO	SITE NAME	DATE	TIME	WATER TEMP	PC 100ML	AIR TEMP	PH	STREAM LVL	WATER COND	INCUBATION	DISS_O2TGM	DILUTIONS	WEATHER	PRECIP_48H
06T	MEADOW CREEK	06/20/90	9:35	17.0	48	66	0.00	1.22	TURBID	23:20	0.00	50ML:22 50ML:26	CLOUDY, FOG	0.00
06T	MEADOW CREEK	07/05/90	9:15	20.0	132	75	0.00	1.12	SLIGHTLY TURBID	23:00	0.00	10ML:14 25ML:33	SUNNY	0.00
06T	MEADOW CREEK	07/16/90	9:36	18.0	613	67	7.50	2.30	EXTREMELY TURBID	23:45	0.00	15ML:112 25ML:133	SUNNY	0.43
06T	MEADOW CREEK	08/02/90	9:05	18.0	184	64	7.96	1.10	CLEAR	22:00	0.00	10ML:15 25ML:41	PARTLY CLOUDY	0.00
06T	MEADOW CREEK	08/16/90	9:50	19.5	60	70	7.84	1.16		.01	0.00	20ML:6 35ML:21	CLOUDY	0.01
06T	MEADOW CREEK	08/30/90	9:20	0.0	112	66	0.00	1.42	MODERATELY TURBID		0.00	10ML:10 25ML:28	CLOUDY	TRACE (0.00 - 0.011
05T	MEADOW CREEK	09/12/90	10:07	20.0	34	70	7.32	1.16	SLIGHTLY MILKY	22:41	0.00	25ML:6 10ML:6	PARTLY SUNNY	0.35
06T	MEADOW CREEK	09/27/90	10:05	0.0	23	65	0.00	1.18	CLEAR	23:00	0.00	50ML:11 100ML:23	FOG	0.00
07T	LAUREL CREEK @ QUINNIMONT	05/10/90	9:30	0.0	20	59	0.00	*	CLEAR	22:15	0.00	50ML:10	CLOUDY, RAIN	0.04
07T	LAUREL CREEK @ QUINNIMONT	05/22/90	9:30	16.0	97	54	0.00	N/A	MODERATELY CLEAR	22:20	0.00	50ML:50 50ML:47	DRIZZLER, VERY CLOUDY	0.69
07T	LAUREL CREEK @ QUINNIMONT	06/11/90	8:40	16.5	9	55	0.00	N/A	CLEAR, FLOWING	22:15	0.00	50ML:2 50ML:7	CLOUDY	0.27
07T	LAUREL CREEK @ QUINNIMONT	06/20/90	8:15	17.0	21	59	0.00	N/A	CLEAR	23:20	0.00	50ML:14 50ML:7	CLOUDY, FOG	0.03
07T	LAUREL CREEK @ QUINNIMONT	07/05/90	8:20	20.0	10	71	0.00	N/A	CLEAR	23:00	0.00	10ML:1 25ML:0	PARTLY CLOUDY, LT FOG, HU	0.69
07T	LAUREL CREEK @ QUINNIMONT	07/16/90	8:23	18.0	293	62	7.51	N/A	TURBID (HIGH)	23:45	0.00	15ML:50 25ML:67	HIGH ALTITUDE FOG	1.33
07T	LAUREL CREEK @ QUINNIMONT	08/02/90	8:03	18.0	11	61	7.60	N/A	CLEAR	22:00	0.00	10ML:1 25ML:3	PARTLY CLOUDY, LT FOG	0.03
07T	LAUREL CREEK @ QUINNIMONT	08/16/90	8:00	19.5	5	67	7.63	N/A	CLEAR	22:15	0.00	50ML:3 50ML:2	FOG	0.01
07T	LAUREL CREEK @ QUINNIMONT	08/30/90	8:20	18.0	23	62	8.30	6.24	CLEAR	0:01	0.00	50ML:11 50ML:12	PARTLY SUNNY, LT FOG	0.01
07T	LAUREL CREEK @ QUINNIMONT	09/12/90	8:42	19.5	6	7.82	6.03		MODERATELY CLEAR	22:41	0.00	100ML:7 50ML:2	CLOUDY	0.44
07T	LAUREL CREEK @ QUINNIMONT	09/27/90	9:05	0.0	2	59	0.00	6.10	CLEAR	23:00	0.00	50ML:1 100ML:0	HEAVY FOG, COOL	0.00
08M	NEW RIVER @ PRINCE	05/10/90	9:05	0.0	42	59	0.00		CLOUDY, HEAVY SEDIMENTS	22:15	0.00	50ML:21	RAIN	.04
08M	NEW RIVER @ PRINCE	05/22/90	9:15	20.0	86	54	0.00	N/A	VERY CLOUDY	22:20	0.00	50ML:43 50ML:18	RAINY, VERY CLOUDY	0.69
08M	NEW RIVER @ PRINCE	06/11/90	8:30	22.0	17	54	0.00	N/A	MODERATELY CLOUDY	22:15	0.00	50ML:7 50ML:10	CLOUDY	0.27
08M	NEW RIVER @ PRINCE	06/20/90	8:05	24.0	16	58	0.00	N/A	CLEAR	22:15	0.00	50ML:7 50ML:9	CLOUDY, FOG	0.03
08M	NEW RIVER @ PRINCE	07/05/90	8:10	26.0	5	71	0.00	N/A	CLEAR	0	0.00	50ML:4 50ML:1	PARTLY CLOUDY, LT FOG	0
08M	NEW RIVER @ PRINCE	07/16/90	8:13	24.0	147	61	7.71	N/A	TURBID (HIGH)	23:45	0.00	50ML:74 50ML:73	FOG	1.33
08M	NEW RIVER @ PRINCE	08/02/90	7:55	25.0	6	61	6.34	N/A	CLEAR	22:00	0.00	50ML:11 50ML:5	PARTLY CLOUDY, LT FOG	0.00
08M	NEW RIVER @ PRINCE	08/16/90	7:50	25.0	21	66	7.89	N/A	CLEAR	22:15	0.00	100ML:22 100ML:20	FOG	0.01
08M	NEW RIVER @ PRINCE	08/30/90	8:05	25.0	49	61	0.00	N/A	MODERATELY TURBID	22:41	7.40	100ML:49 100ML:9	PARTLY SUNNY, LT FOG	0.01
09M	NEW RIVER @ PRINCE	03/12/90	8:32	24.3	10	66	7.35	N/A	MODERATELY CLEAR	23:00	0.00	100ML:11 100ML:8	CLOUDY	0.44
09M	NEW RIVER @ PRINCE	09/27/90	8:43	0.0	28	56	0.00	N/A	CLEAR	22:15	0.00	100ML:33 150ML:36	HEAVY FOG, COOL	0.00
09T	PINEY CREEK	05/10/90	8:46	0.0	0	59	0.00	0.86	CLEAR	22:15	0.00		CLOUDY, RAIN	0.04
09T	PINEY CREEK	05/22/90	8:45	17.0	1240	54	0.00	.92	VERY CLOUDY	22:20	0.00	10ML:124 25ML:TMTC	HEAVY RAIN, COOL	0.69
09T	PINEY CREEK	06/11/90	8:10	18.0	144	54	0.00	0.22	CLEAR, FLOWING	22:15	0.00	10ML:12 25ML:36	CLOUDY	0.27
09T	PINEY CREEK	06/20/90	7:50	13.0	133	58	0.00	0.00	CLEAR, FLOWING	23:20	0.00	5ML:5 10ML:15	CLOUDY, FOG	0.03
09T	PINEY CREEK	07/05/90	7:50	20.5	250	70	0.00	0.20	CLEAR	23:00	0.00	5ML:17 10ML:25	PARTLY CLOUDY, LIGHT FOG	0.00
09T	PINEY CREEK	07/16/90	7:56	19.0	2000	60	7.72	.75	TURBID (HIGH)	23:45	0.00	10ML:200 25ML:TMTC	FOG	1.33
09T	PINEY CREEK	08/02/90	7:40	19.0	144	60	7.81	< 0.00	CLEAR	22:00	0.00	10ML:17 25ML:36	PARTLY CLOUDY, LT FOG	0
09T	PINEY CREEK	08/16/90	7:40	20.5	144	66	7.69	< 0.00	CLEAR	22:15	0.00	15ML:23 30ML:42	FOG	.01
09T	PINEY CREEK	08/30/90	7:50	20.0	49	61	0.00	8.34	CLEAR	?	9.00	10ML:4 25ML:13	PARTLY SUNNY	.01
09T	PINEY CREEK	09/12/90	7:59	20.3	134	65	7.65	8.56	SLTY MURKY	22:41	0.00	25ML:46 10ML:14	CLOUDY	0.44
09T	PINEY CREEK	09/27/90	8:30	10.0	39	55	0.00	8.16	CLEAR	23:00	0.00	25ML:13 50ML:16	HEAVY FOG, COOL	0
10T	SLATER'S CREEK	05/03/90		0.0	0	0.00					0.00			
10T	SLATER'S CREEK	05/15/90	1:57	0.0	7	84	0.00		CLEAR	21:56	0.00	50ML:1 50ML:6	PARTLY SUNNY	0.25
10T	SLATER'S CREEK	05/31/90	12:26	14.0	17	70	0.00		MODERATELY CLEAR	22:03	0.00	100ML:16 100ML:18	SUNNY	.42
10T	SLATER'S CREEK	06/14/90	10:22	18.0	7	74	0.00		CLEAR	23:55	0.00	100ML:12 100ML:2	SUNNY	0.00
10T	SLATER'S CREEK	06/28/90	10:29	18.0	26	72	0.00		CLEAR	24:04	0.00	100ML:21 100ML:31	SUNNY, HUMID	0
10T	SLATER'S CREEK	07/12/90	11:08	20.0	294	74	0.00		SLIGHTLY MURKY	23:51	0.00	100ML:294	CLOUDY, HUMID	0.00
10T	SLATER'S CREEK	07/30/90	11:12	20.0	53	77	0.00		CLEAR	23:50	0.00	100ML:57 50ML:22	PARTLY SUNNY	0.00
10T	SLATER'S CREEK	08/20/90	11:22	20.2	152	82	7.34		MILKY	22:39	0.00	100ML:150 50ML:76	PARTLY SUNNY	0.27
10T	SLATER'S CREEK	09/05/90	10:39	18.6	23	72	7.41		SLIGHTLY MILKY	23:46	0.00	100ML:23 50ML:9	SUNNY	0.00
10T	SLATER'S CREEK	09/18/90	10:40	13.4	21	55	7.68		MODERATELY CLEAR	24:30	0.00	100ML:21 100ML:13	SUNNY, COOL	0.01
11T	DUNLOUP CREEK	05/03/90	12:50	0.0	18	58	0.00		CLEAR	22:15	0.00	50ML:9	PARTLY CLOUDY	.05
11T	DUNLOUP CREEK	05/15/90	12:12	0.0	91	78	0.00		CLEAR	21:56	0.00	50ML:37 50ML:54	PARTLY SUNNY	.25
11T	DUNLOUP CREEK	05/31/90	1:50	16.5	52	73	0.00	5	TURBID	22:03	0.00	50ML:30 50ML:22	SUNNY	.42
11T	DUNLOUP CREEK	06/14/90	8:30	17.0	152	69	0.00	4	CLEAR	23:55	0.00	50ML:82 50ML:76	CLOUDY	0.00
11T	DUNLOUP CREEK	06/28/90	12:05	18.5	138	75	0.00	4.3	SLIGHTLY MILKY*	24:04	0.00	25ML:30 25ML:34	SUNNY, HUMID	0.00
11T	DUNLOUP CREEK	07/12/90	8:20	20.0	148	70	0.00	4	MURKY	23:51	0.00	25ML:36 25ML:38	CLOUDY, HUMID	0.00
11T	DUNLOUP CREEK	07/30/90	8:51	13.0	134	71	0.00	4.1	SLIGHTLY MURKY	22:50	0.00	25ML:58 25ML:39	SUNNY	0

Appendix 5 continued

1	DUNLOP CREEK	09/05/90	8:05	17.8	1740	60	3.33	4	SLIGHTLY MILKY	24:46	0.00	25ML:TNMC	20ML:348	CLOUDY	0.00
2	DUNLOP CREEK	09/18/90	8:30	12.7	24	42	3.27	4	MODERATELY CLEAR	24:30	0.00	20ML:5	5ML:1	CLOUDY, COOL	0.01
3	NEW RIVER @ THURMOND	05/03/90	1:10	0.0	4	68	0.00	6.74		22:15	0.00	50ML:2		PARTLY CLOUDY	.05
4	NEW RIVER @ THURMOND	05/13/90	1:28	0.0	98	93	0.00	6.29	MURKY	21:56	0.00	50ML:39	50ML:59	PARTLY SUNNY	0.25
5	NEW RIVER @ THURMOND	05/31/90	12:58	16.5	357	71	0.00	13.28	TURBID	22:03	0.00	50ML:175	50ML:182	SUNNY	.42
6	NEW RIVER @ THURMOND	06/14/90	9:37	22.5	5	71	0.00	5.52	SLIGHTLY MILKY	23:55	0.00	50ML:3	25ML:1	PARTLY CLOUDY	0.00
7	NEW RIVER @ THURMOND	06/28/90	11:06	25.5	10	73	0.00	4.07	CLEAR	24:04	0.00	50ML:6	50ML:4	SUNNY, HUMID	0
8	NEW RIVER @ THURMOND	07/12/90	10:28	26.5	4	75	0.00	2.95	CLEAR	23:50	0.00	50ML:3	100ML:4	PARTLY SUNNY	0.00
9	NEW RIVER @ THURMOND	07/12/90	9:39	28.5	4	72	0.00	3.18	CLEAR	23:51	0.00	50ML:3	50ML:1	CLOUDY, HUMID	0.00
10	NEW RIVER @ THURMOND	08/20/90	10:20	26.5	23	78	7.95	3.18	SLIGHTLY MILKY	22:39	0.00	100ML:14	100ML:23	PARTLY SUNNY	0.27
11	NEW RIVER @ THURMOND	09/05/90	9:45	25.5	6	69	8.15	2.61	SLIGHTLY CLEAR	23:46	0.00	100ML:7	100ML:4	SUNNY	0.00
12	NEW RIVER @ THURMOND	09/18/90	9:50	20.8	6	50	8.05	3.37	SLIGHTLY CLEAR	22:10	0.00	100ML:4	100ML:8	PARTLY CLOUDY	.05
13	ABBUCCLE CREEK	05/03/90	1:15	0.0	34	68	0.00	1.22		22:15	0.00	50ML:17		PARTLY SUNNY	.25
14	ABBUCCLE CREEK	05/15/90	1:00	0.0	189	83	0.00	1.11	MURKY	21:56	0.00	50ML:86	50ML:103	PARTLY SUNNY	.42
15	ABBUCCLE CREEK	05/31/90	1:24	15.0	128	72	0.00	1.34	MURKY	22:03	0.00	25ML:32	10ML:7	SUNNY	0.00
16	ABBUCCLE CREEK	06/14/90	9:05	16.5	48	70	0.00	1.07	MURKY	23:55	0.00	50ML:24	25ML:12	PARTLY SUNNY	0
17	ABBUCCLE CREEK	06/28/90	11:36	19.0	96	74	0.00	.98	MILKY	24:04	0.00	50ML:50	25ML:23	SUNNY, HUMID	0.00
18	ABBUCCLE CREEK	07/12/90	9:04	20.4	100	71	0.00	0.93	MURKY	23:51	0.00	25ML:22	25ML:28	CLOUDY, HUMID	0
19	ABBUCCLE CREEK	07/30/90	9:34	19.5	92	72	0.00	0.90	TURBID	23:50	0.00	25ML:23	25ML:17	PARTLY CLOUDY	0
20	ABBUCCLE CREEK	08/20/90	9:15	20.5	999	72	8.13	.97	SLIGHTLY TURBID	22:39	0.00	20ML:TNMC	10ML:TNMC	CLOUDY, HUMID	0.27
21	ABBUCCLE CREEK	09/05/90	8:53	18.0	50	65	8.37	0.86	EXTREMELY MURKY	23:46	0.00	25ML:10	5ML:4	PARTLY SUNNY	0.00
22	ABBUCCLE CREEK	09/18/90	9:10	12.5	92	46	8.31	0.84	MODERATELY MURKY	24:30	0.00	25ML:13	15ML:13	CLOUDY, COOL	0.01
23	WANN'S CREEK	05/03/90		0.0	0	0	0.00								
24	WANN'S CREEK	05/15/90	10:46	0.0	8	75	0.00		CLEAR	21:56	0.00	50ML:4	50ML:4	PARTLY SUNNY	.25
25	WANN'S CREEK	05/31/90	10:40	13.0	49	65	0.00		TURBID	22:03	0.00	100ML:56	100ML:41	SUNNY	.42
26	WANN'S CREEK	06/12/90	10:19	16.0	50	66	0.00		MILKY	23:13	0.00	50ML:25		PARTLY CLOUDY	.51
27	WANN'S CREEK	07/02/90	11:45	20.0	43	65	0.00		TURBID	22:17	0.00	100ML:43	100ML:42	SUNNY	.07
28	WANN'S CREEK	07/10/90	11:40	23.5	15	81	0.00		CLEAR	22:46	0.00	50ML:8	50ML:7	PARTLY SUNNY, HUMID	0
29	WANN'S CREEK	08/01/90	11:35	21.0	27	73	0.00		CLEAR	22:47	0.00	100ML:19	100ML:27	PARTLY CLOUDY	.01
30	WANN'S CREEK	08/22/90	12:05	21.0	112	74	7.25		MODERATELY TURBID	22:50	0.00	50ML:55	25ML:29	CLOUDY	0.24
31	WANN'S CREEK	09/04/90	10:40	20.0	15	68	7.88		MODERATELY CLEAR	23:15	0.00	50ML:9	25ML:2	MOSTLY CLOUDY	0.00
32	WANN'S CREEK	09/17/90	11:37	16.3	5	53	7.76		EXTREMELY CLEAR	22:51	0.00	100ML:3	50ML:4	SUNNY	0.10
33	COAL RUN	05/03/90	11:48	0.0	0	65	0.00			22:15	0.00	50ML:3		PARTLY CLOUDY	.05
34	COAL RUN	05/15/90	10:24	0.0	61	70	0.00		SLIGHTLY MURKY	21:56	0.00	50ML:35	50ML:26	PARTLY SUNNY	.25
35	COAL RUN	05/31/90	10:19	13.0	135	62	0.00		SLIGHTLY TURBID	22:03	0.00	50ML:59	50ML:76	SUNNY	.42
36	COAL RUN	06/12/90	9:57	15.0	126	64	0.00		SLIGHTLY CLEAR	23:13	0.00	50ML:63	50ML:100	PARTLY CLOUDY	.51
37	COAL RUN	07/02/90	11:25	17.7	128	64	0.00		TURBID	22:17	0.00	100ML:110	50ML:82	SUNNY	.07
38	COAL RUN	07/10/90	11:12	20.5	72	79	0.00		MILKY	22:46	0.00	50ML:30	25ML:24	SUNNY, HUMID	0
39	COAL RUN	08/01/90	11:05	19.8	44	72	0.00		SLIGHTLY MURKY	22:47	0.00	50ML:22	25ML:13	PARTLY CLOUDY	.01
40	COAL RUN	08/22/90	11:37	20.0	52	73	0.00		MODERATELY TURBID	22:50	0.00	50ML:122	25ML:52	CLOUDY	0.24
41	COAL RUN	09/04/90	10:16	18.1	50	66	8.02		SLIGHTLY TURBID	23:15	0.00	50ML:25	25ML:11	PARTLY SUNNY	0.00
42	COAL RUN	09/17/90	11:10	15.3	27	51	7.89		MODERATELY CLEAR	22:51	0.00	50ML:16	50ML:11	SUNNY, COOL	0.10
43	KEENEY'S CREEK	05/03/90	10:00	0.0	28	62	0.00		CLEAR	22:15	0.00	50ML:14			.05
44	KEENEY'S CREEK	05/15/90	8:25	0.0	226	62	0.00		CLEAR	21:56	0.00	50ML:119	50ML:107	PARTLY SUNNY	.25
45	KEENEY'S CREEK	05/31/90	8:10	13.0	3997	55	0.00		CLEAR	22:15	0.00	50ML:14		PARTLY CLOUDY	.42
46	KEENEY'S CREEK	06/12/90	8:12	13.0	3500	53	0.00		MODERATELY CLEAR	23:13	0.00	10ML:TNMC	5ML:175	SUNNY	.51
47	KEENEY'S CREEK	07/02/90	8:49	18.5	204	57	0.00		CLEAR	22:17	0.00	25ML:63	25ML:39	CLOUDY, COOL	.07
48	KEENEY'S CREEK	07/10/90	8:50	21.0	1240	71	0.00		CLEAR	22:46	0.00	10ML:110	5ML:62	PARTLY CLOUDY, HUMID	0
49	KEENEY'S CREEK	08/01/90	8:33	18.5	890	64	0.00		CLEAR	22:47	0.00	25ML:182	5ML:95	PARTLY CLOUDY	.01
50	KEENEY'S CREEK	08/22/90	9:00	19.0	600	56	7.61		SLIGHTLY MILKY	22:50	0.00	1ML:8	1ML:4	CLOUDY	0.24
51	KEENEY'S CREEK	09/04/90	8:03	17.8	767	62	7.49		CLEAR	23:15	0.00	10ML:66	5ML:49	PARTLY CLOUDY	0.00
52	KEENEY'S CREEK	09/17/90	8:35	14.6	1605	47	7.57		CLEAR	22:15	0.00	10ML:62	5ML:45	PARTLY SUNNY, COOL	0.10
53	NEW RIVER @ FAFETTE STATION	05/03/90	10:58	0.0	12	64	0.00	4.32		22:15	0.00	50ML:6		PARTLY CLOUDY	.05
54	NEW RIVER @ FAFETTE STATION	05/15/90	9:34	0.0	18	65	0.00	3.8	MURKY	21:56	0.00	50ML:11	50ML:7	PARTLY SUNNY	.25
55	NEW RIVER @ FAFETTE STATION	05/31/90	9:17	15.0	373	58	0.00	13.00	TURBID	22:03	0.00	50ML:215	50ML:158	SUNNY	.42
56	NEW RIVER @ FAFETTE STATION	06/12/90	9:12	21.0	48	60	0.00	2.4	MILKY	23:13	0.00	25ML:12	10ML:100	SUNNY	.51
57	NEW RIVER @ FAFETTE STATION	07/02/90	10:04	25.5	9	61	0.00	-1.9	TURBID	22:17	0.00	100ML:7	50ML:7	PARTLY SUNNY	.07
58	NEW RIVER @ FAFETTE STATION	07/10/90	10:00	27.0	3	74	0.00	-7.3	MILKY	22:46	0.00	50ML:1	50ML:2	PARTLY SUNNY, HUMID	0.00
59	NEW RIVER @ FAFETTE STATION	08/01/90	9:50	25.5	5	67	0.00	-0.05	SLIGHTLY MURKY	22:47	0.00	100ML:4	100ML:6	PARTLY CLOUDY	0.01

Appendix 5
continued

SITE NO	SITE NAME	DATE	TIME	WATER TEMP	PC_100ML	AIR_TEMP	PH	STREAM_LVL	WATER_COND	INCUBATION	DISS_O2CN	DILUTIONS	WEATHER	PRECIP_48H
17M	NEW RIVER @ PAYETTE STATION	08/22/90	10:34	26.5	6	70	7.83	-1.04	SLIGHTLY MILKY	22:50	0.00	100ML:7 100ML:4	CLOUDY	0.24
17M	NEW RIVER @ PAYETTE STATION	09/04/90	9:18	25.5	5	64	8.10	-0.69	SLIGHTLY TURBID	23:15	0.00	100ML:5 100ML:4	PARTLY CLOUDY	0.00
17M	NEW RIVER @ PAYETTE STATION	09/17/90	10:00	22.5	7	50	8.01	1.19	MODERATELY MURKY	22:51	0.00	100ML:5 100ML:8	SUNNY, COOL	0.10
18T	WOLF CREEK	05/03/90	10:50	0.0	2	64	0.00	1.65		22:15	0.00	50ML:1	PARTLY CLOUDY	.05
18T	WOLF CREEK	05/15/90	9:20	0.0	88	65	0.00	1.52	MODERATELY CLEAR	21:56	0.00	50ML:49 50ML:39	PARTLY SUNNY	.25
18T	WOLF CREEK	05/31/90	9:08	13.0	88	58	0.00	1.90	TURBID	22:03	0.00	50ML:32 50ML:56	SUNNY	.42
18T	WOLF CREEK	06/12/90	9:06	15.0	0	59	0.00	1.92	TURBID	23:13	0.00	25ML:TNIC 100ML:INV	SUNNY	.51
18T	WOLF CREEK	07/02/90	9:59	17.0	42	61	0.00	1.24	SLIGHTLY TURBID	22:17	0.00	50ML:21 25ML:17	PARTLY SUNNY	.07
18T	WOLF CREEK	07/10/90	9:55	19.0	40	74	0.00	1.19	SLIGHTLY MILKY	22:46	0.00	50ML:20 25ML:10	PARTLY SUNNY, HUMID	0.00
18T	WOLF CREEK	08/01/90	9:43	18.0	64	67	0.00	1.18	SLIGHTLY MILKY	22:47	0.00	50ML:35 50ML:29	PARTLY CLOUDY	.01
18T	WOLF CREEK	08/22/90	10:10	18.5	42	69	8.41	1.22	SLIGHTLY TURBID	22:50	0.00	25ML:4 50ML:21	CLOUDY	0.24
18T	WOLF CREEK	09/04/90	9:06	17.3	42	64	8.51	1.05	SLIGHTLY MILKY	23:15	0.00	50ML:8 50ML:21	PARTLY CLOUDY	0.00
18T	WOLF CREEK	09/17/90	9:45	15.0	19	50	8.47	1.04	SLIGHTLY MURKY	22:51	0.00	50ML:12 50ML:7	SUNNY, COOL	0.10
19T	MARR BRANCH	05/03/90	10:30	0.0	58	64	0.00	0.82	MURKY	22:15	0.00	50ML:58	PARTLY CLOUDY	.05
19T	MARR BRANCH	05/15/90	8:54	0.0	182	63	0.00	0.68	MURKY	21:56	0.00	50ML:260 50ML:91	PARTLY SUNNY	.25
19T	MARR BRANCH	05/31/90	8:40	14.0	116	56	0.00	1.06	MILKY	22:03	0.00	25ML:29 100ML:18	SUNNY	.42
19T	MARR BRANCH	06/12/90	8:40	13.5	0	57	0.00	1.26	MILKY	23:13	0.00	25ML:INV 100ML:INV	SUNNY	.51
19T	MARR BRANCH	07/02/90	9:20	17.3	874	58	0.00	0.59	MILKY	22:17	0.00	25ML:192 100ML:114	PARTLY SUNNY	.07
19T	MARR BRANCH	07/10/90	9:15	21.0	1960	71	0.00	.55	MILKY	22:46	0.00	5ML:115 5ML:81	PARTLY SUNNY, HUMID	0
19T	MARR BRANCH	08/01/90	9:10	18.7	3300	65	0.00	.61	TURBID	22:47	0.00	5ML:133 1ML:33	PARTLY CLOUDY	.01
19T	MARR BRANCH	08/22/90	9:42	20.2	850	67	7.37	.67	EXTREMELY MILKY	22:50	0.00	1ML:6 1ML:11	CLOUDY	0.24
19T	MARR BRANCH	09/04/90	8:40	17.5	6800	63	7.52	.51	EXTREMELY MILKY	23:15	0.00	5ML:231 1ML:68	PARTLY CLOUDY	0.00
19T	MARR BRANCH	09/17/90	9:12	15.0	667	48	7.56	7.56 0	EXTREMELY MILKY	22:51	0.00	1ML:7 5ML:3	SUNNY, COOL	0.10
				3107.1	90532	12748	513.35					16.40		

SINIBRO

DATE	SITE NO	SITE NAME	COMMENTS
01M	NEW RIVER @ BINTON VC	05/10/90	PRECIP: BECKLEY READS.
01M	NEW RIVER @ BINTON VC	05/22/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
01M	NEW RIVER @ BINTON VC	06/11/90	PRECIP: BECKLEY READ.
01M	NEW RIVER @ BINTON VC	06/20/90	LICE CREEK
01M	NEW RIVER @ BINTON VC	07/05/90	LICE CREEK
01M	NEW RIVER @ BINTON VC	07/16/90	LICE CREEK
01M	NEW RIVER @ BINTON VC	08/02/90	LICE CREEK
01M	NEW RIVER @ BINTON VC	08/16/90	LICE CREEK
01M	NEW RIVER @ BINTON VC	08/30/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
01M	NEW RIVER @ BINTON VC	09/12/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
01M	NEW RIVER @ BINTON VC	09/27/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	05/10/90	PRECIP: BECKLEY READ. STP
02T	MADAM'S CREEK	05/22/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	06/11/90	PRECIP: BECKLEY READ. STP
02T	MADAM'S CREEK	06/20/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	07/05/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	07/16/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	08/02/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	08/16/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	08/30/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	09/12/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
02T	MADAM'S CREEK	09/27/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	05/10/90	PRECIP: BECKLEY READ. STP
03M	NEW RIVER @ BINTON SEWAGE TP	05/22/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	06/11/90	PRECIP: BECKLEY READ. STP
03M	NEW RIVER @ BINTON SEWAGE TP	06/20/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	07/05/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	07/16/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	08/02/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	08/16/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	08/30/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	09/12/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
03M	NEW RIVER @ BINTON SEWAGE TP	09/27/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	05/10/90	PRECIP: BECKLEY READ. STP
04M	NEW RIVER @ SANDSTONE FALLS	05/22/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	06/11/90	PRECIP: BECKLEY READ. STP
04M	NEW RIVER @ SANDSTONE FALLS	06/20/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	07/05/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	07/16/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	08/02/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	08/16/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	08/30/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	09/12/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.
04M	NEW RIVER @ SANDSTONE FALLS	09/27/90	WATER TEMP/DO READS INVALID. DO METER NOT WORKING.

Appendix 6 continued

SITE NO	SITE NAME	DATE	COMMENTS	SITE NO	SITE NAME	DATE	COMMENTS
09T	PINEY CREEK	05/10/90	DILUTIONS: TESTS FAILED STP BECKLEY STP. NO. BECKLEY STP. CRAB ORCHARD STP AND SHADY SPRING STP	13T	ARBUCLE CREEK	05/03/90	STP ARBUCELE PSD AND OAK HILL STP
09T	PINEY CREEK	05/22/90		13T	ARBUCLE CREEK	05/15/90	
09T	PINEY CREEK	05/11/90		13T	ARBUCLE CREEK	05/31/90	
09T	PINEY CREEK	06/20/90		13T	ARBUCLE CREEK	06/14/90	
09T	PINEY CREEK	07/05/90		13T	ARBUCLE CREEK	06/28/90	WATER CONDITION: CLEAR. VERY SHALLOW
09T	PINEY CREEK	07/16/90		13T	ARBUCLE CREEK	07/12/90	WATER CONDITION: CLEARER. SHALLOW AREAS
09T	PINEY CREEK	08/02/90		13T	ARBUCLE CREEK	07/30/90	
09T	PINEY CREEK	08/16/90		13T	ARBUCLE CREEK	08/20/90	
09T	PINEY CREEK	08/30/90	PINEY CR ELEVATION: 1178'. DO METER SET AT 1205' FOR SD W. 00 READING ATTEMPTED.	13T	ARBUCLE CREEK	09/05/90	FC/100ML:TWTC:999 = ABB. NO. PB AT 16.7C. WATER COND: EXTR MURKY, DEEPER POOLS: SILTY/MOD TURBID. PSTER WAT: SILTY MURKY. SHLW/SLOW
09T	PINEY CREEK	09/12/90	25ML DIL: MUCH WATER IN DISH. FCs POOR. PB AT 17C.	13T	ARBUCLE CREEK	09/18/90	WATER CONDITION: SEE 9/5/90 COMMENTS
09T	PINEY CREEK	05/27/90		14T	MAN'S CREEK	05/03/90	NO SAMPLE TAKEN
10T	SLATER'S CREEK	05/03/90	NO SAMPLE TAKEN THIS DATE	14T	MAN'S CREEK	05/15/90	
10T	SLATER'S CREEK	05/15/90		14T	MAN'S CREEK	05/31/90	
10T	SLATER'S CREEK	05/31/90		14T	MAN'S CREEK	06/12/90	
10T	SLATER'S CREEK	06/14/90	100ML: SAMPLE B = 2-3	14T	MAN'S CREEK	07/02/90	
10T	SLATER'S CREEK	06/28/90		14T	MAN'S CREEK	07/10/90	
10T	SLATER'S CREEK	07/12/90	DILUTIONS: 2ND 100ML SAMPLE INV. BLURRED AROUND OUTSIDE. WATERY. THE294 COUNT MAY BE INACCURATE TOO.	14T	MAN'S CREEK	08/01/90	WATERY FILM AROUND SOME FCS
10T	SLATER'S CREEK	07/30/90		14T	MAN'S CREEK	08/22/90	
10T	SLATER'S CREEK	08/20/90		14T	MAN'S CREEK	09/04/90	
10T	SLATER'S CREEK	09/05/90	PB AT 16.5	15T	COAL RUN	09/17/90	PB AT 19.8C;
10T	SLATER'S CREEK	09/18/90		15T	COAL RUN	05/03/90	
11T	DUNLOUP CREEK	05/03/90	STP WHITE OAK PSD	15T	COAL RUN	05/15/90	
11T	DUNLOUP CREEK	05/15/90	STP WHITE OAK PSD	15T	COAL RUN	05/31/90	
11T	DUNLOUP CREEK	05/31/90	STP WHITE OAK PSD	15T	COAL RUN	06/12/90	BOTH DILUTIONS: BLUE GREEN NOT APPARENT ON MANY DOTS. ACCURACY OF COUNT QUESTIONABLE.
11T	DUNLOUP CREEK	06/14/90	BEGAN USING FLUORESCENT LT TO READ FCS. STP WHITE OAK PSD TOOK SAMPLE FROM DEEPER SPOT, CLOSE TO REGULAR SITE.	15T	COAL RUN	07/02/90	SAMPLE SITE: WATER POOLED, NOT FLOWING WELL.
11T	DUNLOUP CREEK	06/28/90	*WAT/COND: IN DEEPER POOLS: SHALLOW H2O, CLEAR. WATER CONDITIONS: MURKY, DEEPER POOLS: MUCH CLEARER, SHALLOW AREAS	15T	COAL RUN	07/10/90	
11T	DUNLOUP CREEK	07/12/90	WATER CONDITION: MURKY, DEEPER POOLS: CLEAR, SHALLOW AREAS. WATER LEVEL: 4.1 = EST.	15T	COAL RUN	08/01/90	WATER CONDITION: CLEAR IN VERY SHALLOW AREAS
11T	DUNLOUP CREEK	07/30/90		15T	COAL RUN	08/22/90	BOTH MEMBRANES: MANY FCS PARTICULATES. WATER IN INDISTINCT. WATER IN DISHES: POSS. DIE-OFF OF FCS. SAMPLED FROM OPP. SIDE OF CREEK (RT) DUE TO SEDIMENT IN USUAL SITE. PAST PROBS. WITH PARTICULATES.
11T	DUNLOUP CREEK	08/20/90		15T	COAL RUN	09/17/90	MANY PARTICULATES, FCS POOR. PH AT 18C.
11T	DUNLOUP CREEK	09/05/90	PH AT 16C. FCS SMALL, WATERY.	16T	KEENEY'S CREEK	05/03/90	
11T	DUNLOUP CREEK	09/18/90		16T	KEENEY'S CREEK	05/15/90	
12M	NEW RIVER @ THURMOND	05/03/90		16T	KEENEY'S CREEK	05/31/90	
12M	NEW RIVER @ THURMOND	05/15/90		16T	KEENEY'S CREEK	06/12/90	
12M	NEW RIVER @ THURMOND	05/31/90	STREAM LVL AT HIGHEST POINT OF SUMMER TESTING DATES.	16T	KEENEY'S CREEK	07/02/90	
12M	NEW RIVER @ THURMOND	06/14/90	WATER COND: CLEAR NEAR SHORE	16T	KEENEY'S CREEK	07/10/90	
12M	NEW RIVER @ THURMOND	06/28/90		16T	KEENEY'S CREEK	08/01/90	WATERY DOTS: 25ML = WATERY. INDISTINCT
12M	NEW RIVER @ THURMOND	07/12/90		16T	KEENEY'S CREEK	08/22/90	POSS. DIE-OFF OF FCS: 1 HRS FROM START TO INCUBATION
12M	NEW RIVER @ THURMOND	08/20/90		16T	KEENEY'S CREEK	09/18/90	
12M	NEW RIVER @ THURMOND	09/05/90					

SITE NO	SITE NAME	DATE	COMMENTS
16T	KEENEY'S CREEK	09/04/90	
16T	KEENEY'S CREEK	09/17/90	PH AT 18C
17M	NEW RIVER • FAYETTE STATION	05/03/90	
17M	NEW RIVER • FAYETTE STATION	05/15/90	
17M	NEW RIVER • FAYETTE STATION	05/31/90	
17M	NEW RIVER • FAYETTE STATION	06/12/90	
17M	NEW RIVER • FAYETTE STATION	07/02/90	
17M	NEW RIVER • FAYETTE STATION	07/10/90	
17M	NEW RIVER • FAYETTE STATION	08/01/90	WATER COND: CLEAR NEAR SHORE.
17M	NEW RIVER • FAYETTE STATION	08/01/90	STR LEVEL: THURMOND GAGE =
17M	NEW RIVER • FAYETTE STATION	08/22/90	2.12: PER CONVERSION CHART.
			FAY STA = -0.06.
17M	NEW RIVER • FAYETTE STATION	09/04/90	STR DEV: CHECK CONVERSION CHART.
17M	NEW RIVER • FAYETTE STATION	09/17/90	PH AT 18C.
18T	WOLF CREEK	05/02/90	NOTE: THERE IS A LIPT STATION ON HOUSE BRANCH OF WOLF CR. WHEN OVERLOADED, MAY INCREASE FCS IN WOLF
18T	WOLF CREEK	05/15/90	
18T	WOLF CREEK	05/31/90	
18T	WOLF CREEK	06/12/90	25ML: FCS HARD TO READ: PROP TNTC. 10ML: FCS NOT WELL DEFINED.
18T	WOLF CREEK	07/02/90	
18T	WOLF CREEK	07/10/90	
18T	WOLF CREEK	08/01/90	BOTB DILUTIONS: MUCH SEDIMENT
18T	WOLF CREEK	08/22/90	50ML: SEDIMENT ON MEMBRANE. 25ML: WATER IN DISE. INVALID
18T	WOLF CREEK	09/04/90	
18T	WOLF CREEK	09/17/90	50ML: DOTS POOR. PH AT 18C.
19T	MARR BRANCH	05/03/90	
19T	MARR BRANCH	05/15/90	
19T	MARR BRANCH	05/31/90	
19T	MARR BRANCH	06/12/90	DILUTIONS INVALID
19T	MARR BRANCH	07/02/90	25ML: FCS VERT DIFFICULT TO COUNT: MANY SMALL, POORLY FORMED DOTS
19T	MARR BRANCH	07/16/90	WATER CONDITION: CLOUDY APPEARANCE. BOTTOM VISIBLE
19T	MARR BRANCH	08/01/90	
19T	MARR BRANCH	08/22/90	
19T	MARR BRANCH	09/04/90	
19T	MARR BRANCH	09/17/90	1ML: FCS POOR

